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OCTOBER 1987
VOLUME 5
NUMBER 10

FAMILY & HOME OFFICE COMPUTING™

Women in Business at Home:

Juggling Career and Family

Home-Office ShopTalk

Car Shopping On CompuServe

Get More From DOS

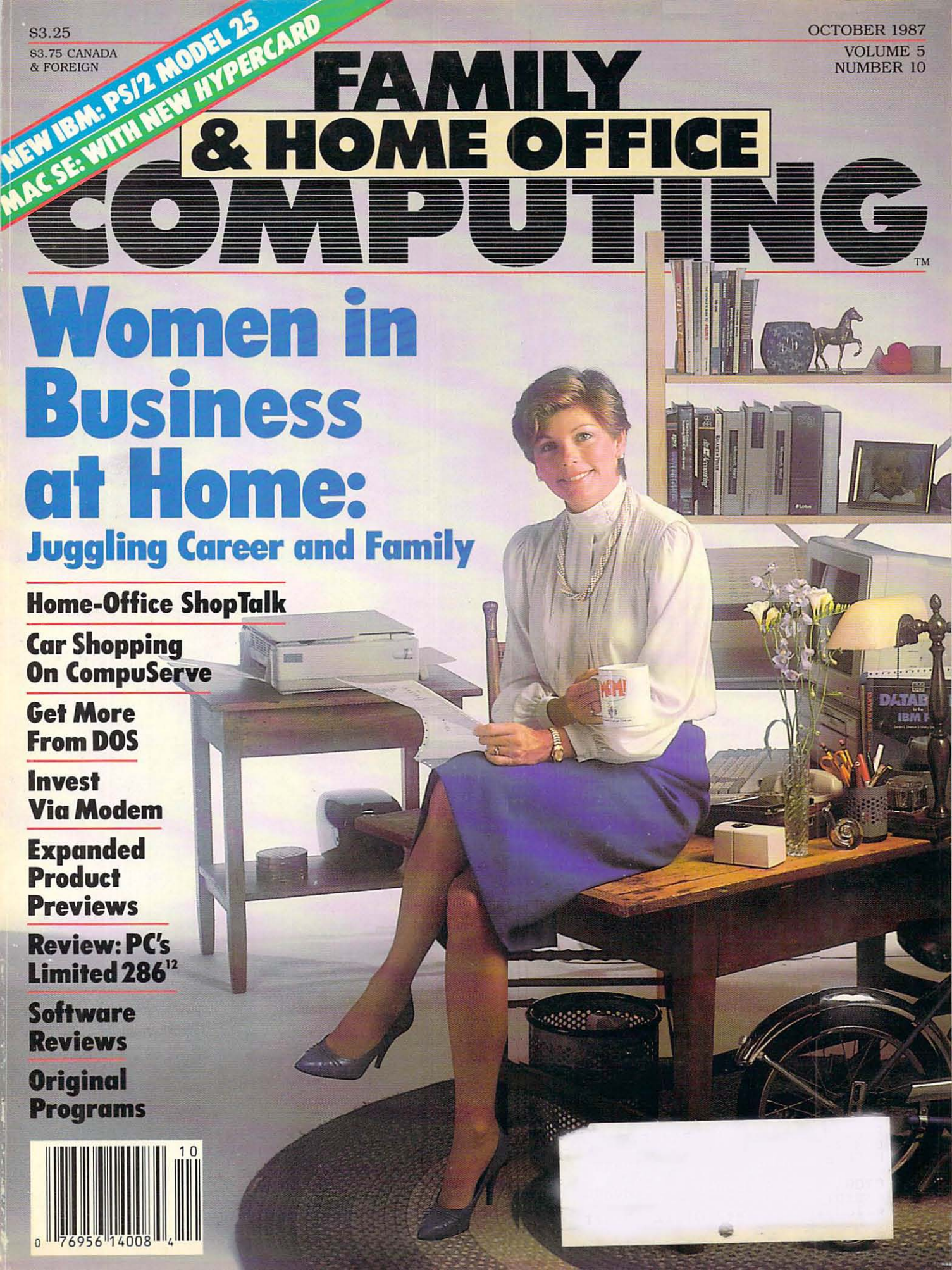
Invest Via Modem

Expanded Product Previews

Review: PC's Limited 286[12]

Software Reviews

Original Programs



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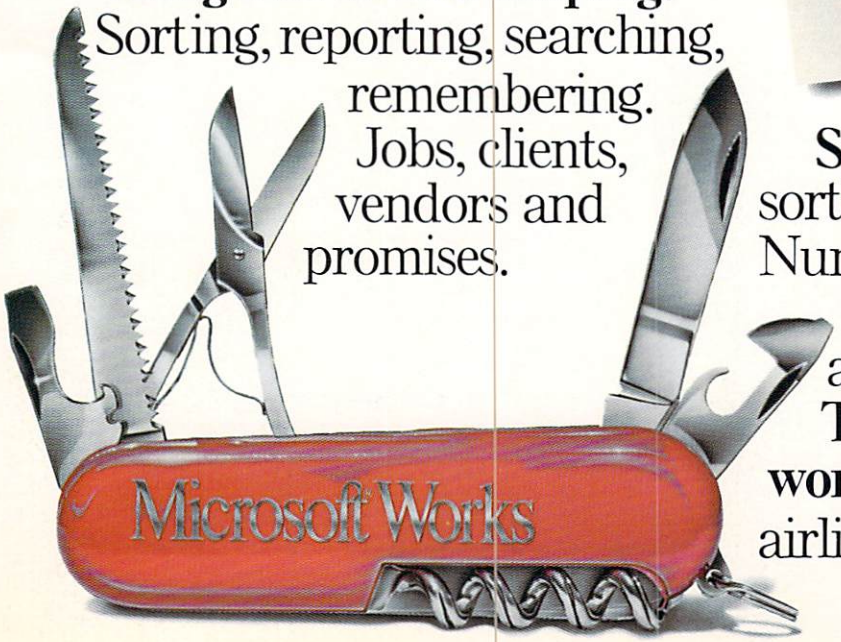

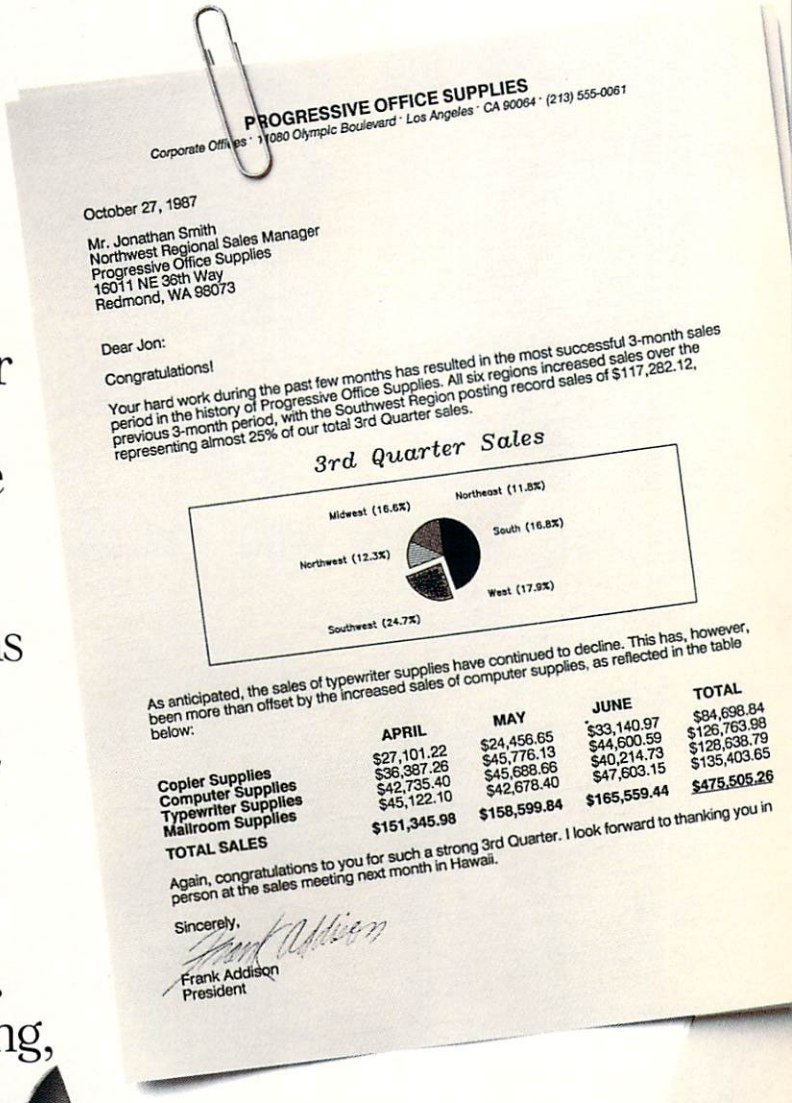

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October 27, 1987

Mr. Jonathan Smith
Northwest Regional Sales Manager
Progressive Office Supplies
16011 NE 36th Way
Redmond, WA 98073

Dear Jon:

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Your hard work during the past few months has resulted in the most successful 3-month sales period in the history of Progressive Office Supplies. All six regions increased sales over the previous 3-month period, with the Southwest Region posting record sales of $117,282.12, representing almost 25% of our total 3rd Quarter sales.

3rd Quarter Sales

As anticipated, the sales of typewriter supplies have continued to decline. This has, however, been more than offset by the increased sales of computer supplies, as reflected in the table below:

	APRIL	MAY	JUNE	TOTAL
Copier Supplies	$27,101.22	$24,456.65	$33,140.97	$84,698.84
Computer Supplies	$36,387.26	$45,776.13	$44,600.59	$126,763.98
Typewriter Supplies	$42,735.40	$45,688.66	$40,214.73	$128,638.79
Mailroom Supplies	$45,122.10	$42,678.40	$47,603.15	$135,403.65
TOTAL SALES	$151,345.98	$158,599.84	$165,559.44	$475,505.26

Again, congratulations to you for such a strong 3rd Quarter. I look forward to thanking you in person at the sales meeting next month in Hawaii.

Sincerely,

Frank Addison
President

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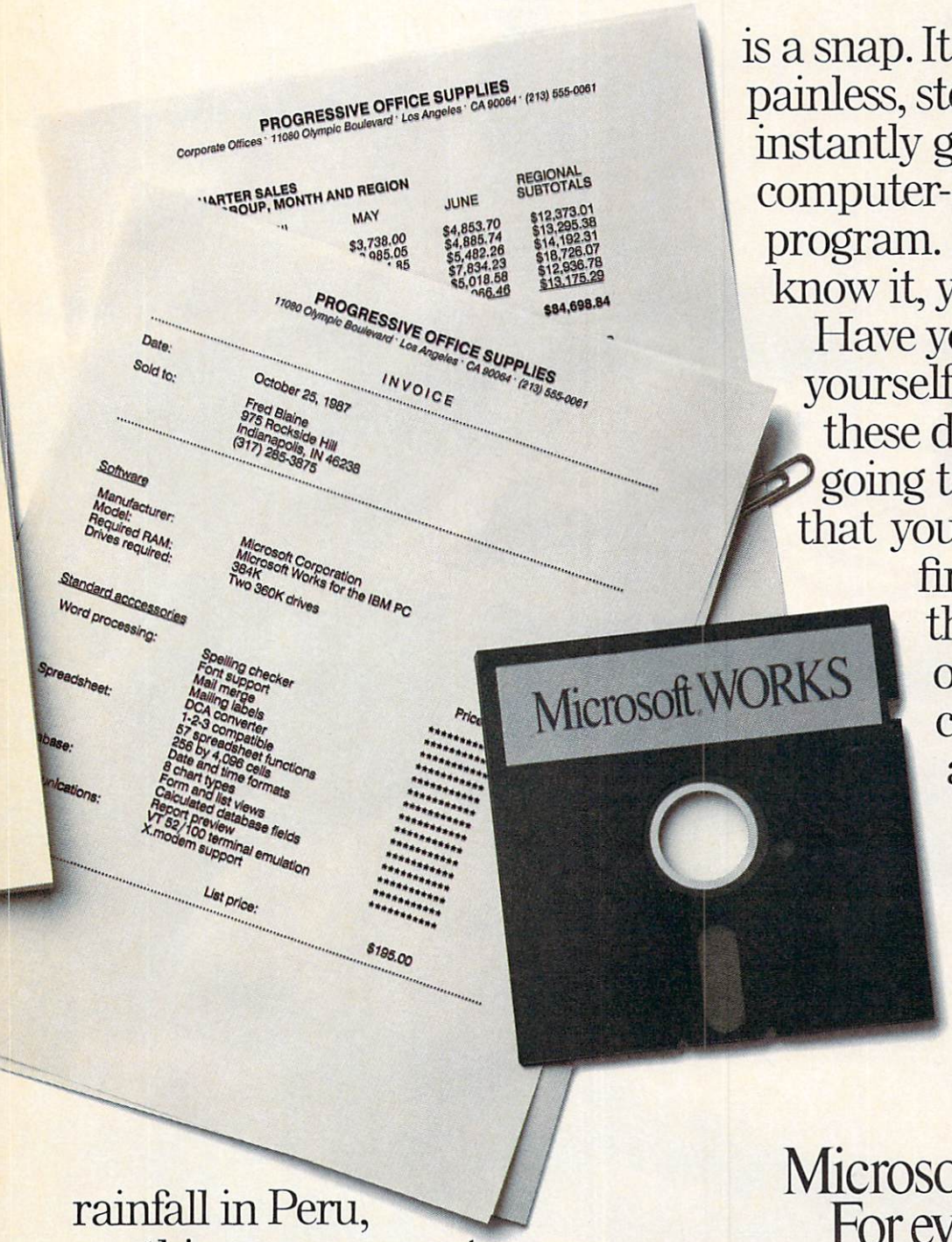

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CIRCLE READER SERVICE 12

PUBLISHED BY SCHOLASTIC INC.

OCTOBER
1987

FAMILY & HOME OFFICE COMPUTING™

VOLUME 5
NUMBER 10

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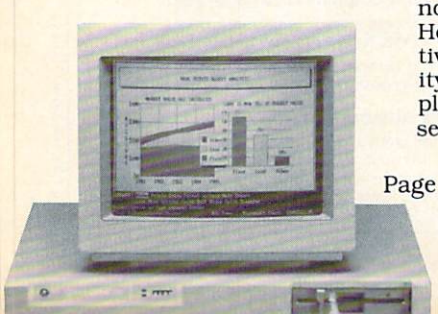

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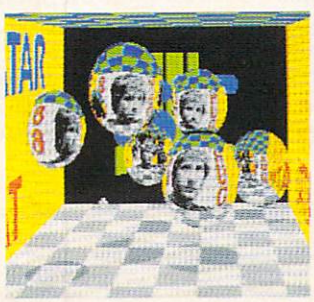

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COVER PHOTOGRAPH BY JOEL WHITE

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EDITOR'S NOTE

FAMILY & HOME-OFFICE COMPUTING—WHAT AND WHY

In January 1983, I resumed a working relationship with a former colleague named Vincent Ceci. With the go-ahead from both Dick Robinson, Scholastic Inc.'s president, and the company's board of directors, we took on the challenge of creating a new magazine. Vincent was to be the designer, and I the editor. We had an idea, a title, and a description of what we were setting out to do.

After just a couple of weeks, Vincent presented me with 19 logo designs, then two more, and finally one last proposal. Each was a creative solution for presenting our magazine title, FAMILY COMPUTING. The logo we chose has been distinctive and admired and has served us well for more than four years.

Countless times over these past years, people remarked, "Your magazine has a perfect title." And it did.

For the first half of our four-year history, computer-owning families directed their computing activities almost exclusively to education, entertainment, and personal productivity. And the name "FAMILY COMPUTING" clearly covered those areas. But exactly two years ago, in our October 1985 issue, our cover story heralded a new direction: Business at Home.

Over the next many months, we saw a proliferation of low-cost MS-DOS computers and millions of people buying them for home use, particularly for bringing work home from the office and for setting up home-based businesses. Independent research and letters from readers confirmed that we had entered a new era of computing at home.

Publisher Shirrel Rhoades, Associate Publisher Paul Reiss, and I began to wonder how many people would see our name embracing their work-at-home endeavors. Could the existing name, "FAMILY COMPUTING," connote this rapidly growing trend? "No" was the answer we heard with increasing frequency.

The challenge was to make it obvious that "FAMILY COMPUTING" included *all* at-home computing activities. We ran big type on our covers. We added the line, "For the Home and Home Office." We featured articles on working at home and a regular department called "Home Office." But it wasn't clear enough.

Publisher Shirrel Rhoades, Associate Publisher Paul Reiss, and Design Director Vincent Ceci (left to right) meet with Editor Claudia Cohl in front of the newly expanded logo.

Finally we acknowledged that we had just one choice: We would have to expand our title to include the newest and fastest-growing interest of our readers. Setting up a computer-based home office was not a fad.

And so with this issue we become FAMILY & HOME-OFFICE COMPUTING.

Design Director Vincent Ceci has modified his original logo design to incorporate the title change. FAMILY & HOME-OFFICE COMPUTING reflects the editorial direction of our magazine for the past year or two.

You will find that our magazine today more effectively than ever demonstrates that it is only in the home that computers are put to full use—for education, entertainment, personal productivity, and business purposes.

Above all, we remain committed to keeping up with your growing interests in computing.

Claudia Cohl

CLAUDIA COHL
EDITOR-IN-CHIEF

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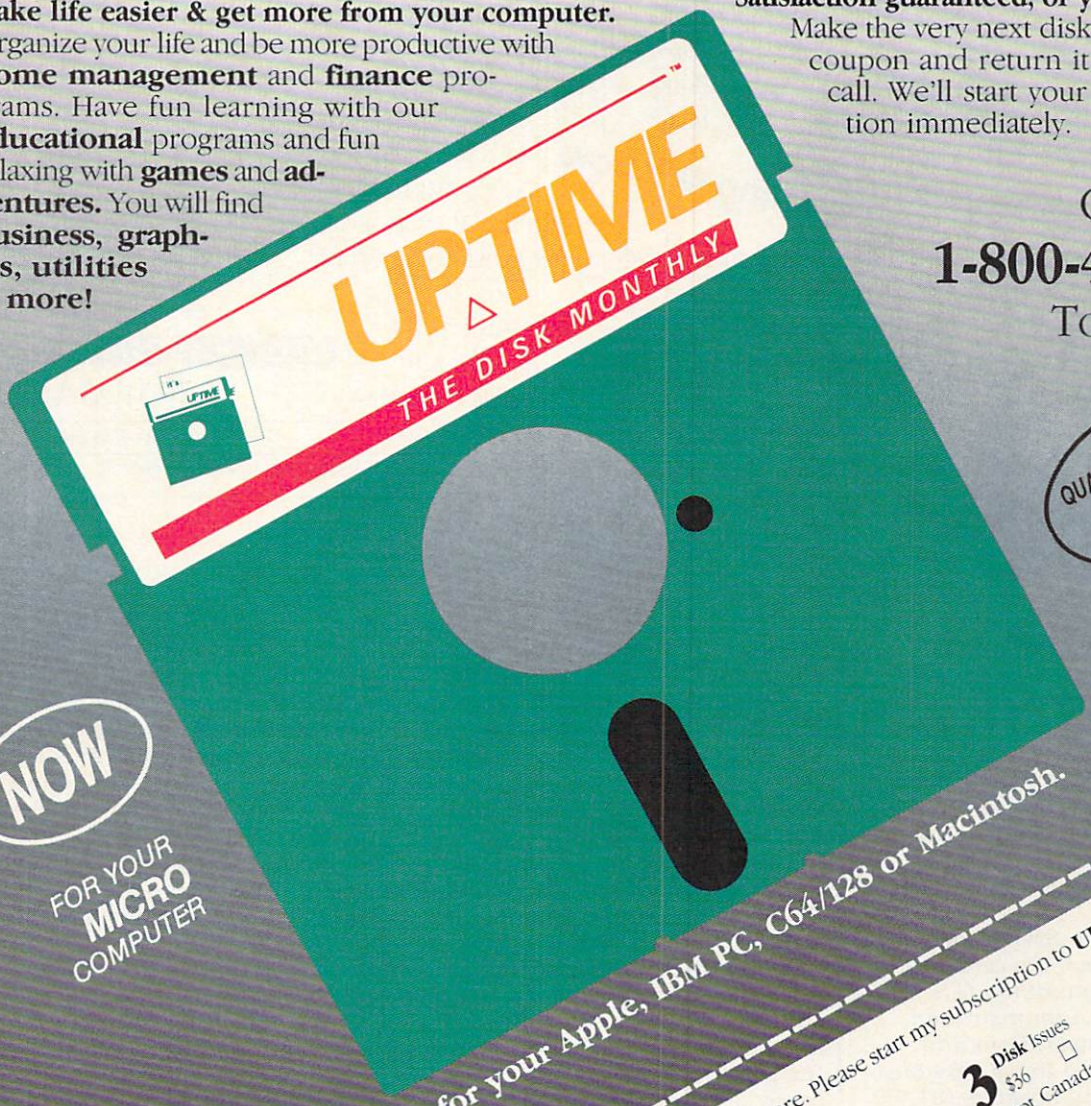

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LETTERS

SBA CHARGES FOR PAMPHLETS

In "Starting Your Own Home Business" in the April issue, the information regarding the Small Business Administration pamphlets is no longer valid. The SBA now charges a fee for most of the pamphlets listed.

WILLIAM CENCI
Richfield, Minnesota

EDITOR'S NOTE: *The SBA pamphlets we listed are now fifty cents and are available by writing: U.S. Small Business Administration, P.O. Box 30, Denver, Colorado 80201-0030. For a list of SBA business-development booklets ($1.75–$6.50), contact the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.*

THANKS FOR BUSINESS HELP

I recently decided to purchase a computer with the intent of using it to earn extra money. My plan is to start with word processing, something I know very well, and possibly branch out into other money-making ventures.

While awaiting the delivery of my IBM PC XT 286, I started checking around to see what support services were available and was shocked to discover a dearth of general information in book and software stores.

Then, just when I was beginning to feel as though I had landed in the middle of the ocean without a life raft, I discovered your magazine. Before I reached the halfway mark in my first issue, I'd ordered a two-year subscription and your *Software Review 1987* special issue. I've read the past two issues from cover to cover; it's become my life preserver.

Thanks for publishing a magazine I can understand and love.

ELAINE J. BONDRA
Peekskill, New York

SWEET AND SOUR NOTES

I wish to compliment you on your coverage of music hardware and software in the July issue. However, you neglected to mention a very obvious source of music products for your readers.

Our company, Future Music, is a computer-music business that is dedicated to the home musician and computer enthusiast. We encourage any of your readers who might have questions about MIDI or other computer-music applications to write or call: Future Music, P.O. Box 1090, Reno, NV 89504 ([702] 826-6434).

TOM WHITE
FUTURE MUSIC
Reno, Nevada

When we received our copy of your July issue in which the article "Making Music" appeared, we were extremely disappointed that CODA Music Software was not mentioned even once in the article.

Our CODA catalog carries over 600 music software products, it's the *only* catalog like it, and it offers a very convenient service to the consumer. We even publish a monthly newsletter to keep our customers updated on the latest business trends. The CODA catalog has re-

ceived positive reviews in a number of computer and music publications.

Your article barely skimmed the surface of the issues that face today's music-technology buyer.

DANIEL KANTOR
CODA MUSIC SOFTWARE
Bloomington, Minnesota

EDITOR'S NOTE: *To obtain the CODA catalog, write to CODA Music Software, Music Learning Division, 1401 East 79th Street, Bloomington, MN 55420-1590 or call collect (612) 854-9554.*

MORE MAIL ON MAIL ORDER

I can understand Captain Ronald Miller's frustration at the refusal of most mail-order houses to ship to APO and FPO addresses (Letters, July 1987). I believe he misunderstood the nature of the problem.

If my business ships a package via the U.S. Postal Service, we must take it to the post office, stand in line, pay cash, and contend with a maze of regulations regarding weight and size limitations to different zip codes. Commercial carriers cannot accept packages addressed to an FPO or APO address or a post-office box.

Most of us are sorry to pass up the sales we could make to military personnel stationed overseas, but it is simply not worth the trouble of shipping via the mail. Perhaps Captain Miller and others could work with their service branches to develop a system that would allow commercial carriers to ship to APO and FPO addresses.

MICHAEL M. KRIEG
OWNER, BAY AREA DENTAL EQUIPMENT
Oakley, California

HOW TO TRY SOFTWARE BEFORE BUYING?

As a recent purchaser of an IBM Personal System/2 Model 30 computer, monitor, and printer, I have started to check around for software.

With the exception of some word-processing programs such as *WordPerfect*, local dealers were unable or unwilling to demonstrate software.

One of the suggestions given in your magazine recently was to try out the software before buying ("Shopping for Software," June 1987).

Computer software is one of the few consumer items that must be bought on faith and comes without provision for refund or exchange if the buyer isn't satisfied.

SUSIE REDFERN
South Bound Brook, New Jersey

EDITOR'S NOTE: *Take heart: More software publishers are offering money-back guarantees; for programs reviewed in our Software Guide, this is indicated in the "backup policy" column. Read this month's Home-School Connection for an article about using libraries as resources to try out software, and watch for a feature on "shareware" in an upcoming issue. Fortunately, more and more retail outlets, such as the Egghead chain, will allow you to try out software.*

FAMILY & HOME-OFFICE COMPUTING *looks forward to letters from all its readers. Please direct your correspondence to: Letters to the Editor,* FAMILY & HOME-OFFICE COMPUTING, *730 Broadway, New York, NY 10003. Include your name, address, and phone number. We reserve the right to edit letters for length and clarity.*

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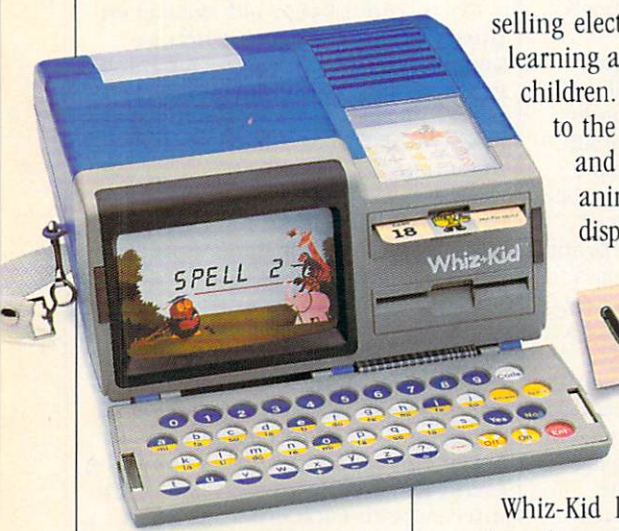

The child's bridge to a personal computer. For ages 5 and up.

Whiz-Kid is the best selling electronic learning aid for children. Thanks to the keyboard and an animated LCD display screen, Whiz-Kid looks, sounds and acts like a real computer. Not only does it help youngsters gain confidence in the computer world, it helps them gain a lot of knowledge. 50 programmed learning cards explore a wide range of subjects. From math, spelling, music and logic to shapes, colors and the weather. It even lets would-be Beethovens create melodies and then hear an instant replay. What's more, Whiz-Kid is expandable. Additional cartridges are available, each with its own set of 50 learning cards. They include:

Alphabet Fun, Numbers Fun, Words Fun, I.Q. Builder and Encyclopedia Jr.

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CIRCLE READER SERVICE 47

FAMILY COMPUTING®

GREAT EXPECTATIONS, GREATER REALIZATIONS

The Koskis of Nashville, Tennessee

BY KATHLEEN KOSKI

This new department will feature either a reader profile or a forum for your computing questions.

Our entire family, including myself and my husband, Jerry, and our three boys, Chris, 14, Patrick, 9, and Joey, 7, has gained more from the computer than we ever imagined. When we set out to make our initial investment, we had three criteria: First, we wanted a computer that would be compatible with the software being used by the construction company my husband worked for. Second, we wanted educational software for the children and myself. Third, my husband and children, who are video-arcade addicts, couldn't wait to be able to play new and more interesting games right here at home.

With these criteria in mind, we subscribed to FAMILY COMPUTING and studied the next six issues before deciding to buy a Tandy 1000, just before Christmas 1985. With the added benefit of a Panasonic KX-P1091 printer, our system has far exceeded our original expectations.

A BUSINESS AND LEARNING PARTNER

Right away, Jerry began using the computer to prepare for a career move into construction management, plugging the real costs from his construction job into *Rags to Riches* (Chang Labs), an integrated financial program. He has been able to simulate what an actual job would cost and make weekly comparisons of these costs in order to stay within a projected profit margin.

The Koskis (clockwise, from left): Jerry, Kathleen, Joey, 7, and Patrick, 9. Not pictured: Chris, 14.

Jerry has also been taking evening courses in electronics and computer science for the past year while doing remodeling work during the day. Having a computer at home saves him long hours at the school's computer lab, and we get to see more of him. After studying BASIC programming one semester, he wrote an educational math program in which we are able to enter different math problems to meet each of the boy's individual needs.

I also look to the computer for help in business. I run a small distributorship from home, selling locally made health foods. I store all my records on *Nutshell* (Nashoba Systems, Inc.), entering the number of items that are sold, the cost of each item, total sales, and my profit for the week. In addition, I keep a running account for each individual item and a running grand total for all products.

It takes me a few minutes to enter my records into the file and seconds for the computer to do all the weekly bookkeeping! Knowing how each product is performing helps me identify the most successful ones and concentrate on building those sales.

I am also a full-time education student at Tennessee State University, and I am totally dependent on my word processor, *Writing Assistant* (IBM Corp.). I have all my writing assignments saved to disk and can access them when it is "my time" on the computer—usually when no one else is at home!

MY THREE COMPUTING SONS

Of all the boys, Patrick has benefited most from the computer. After just a few months, he had made marked progress in overcoming the learning problems associated with a short attention span. Now, he's actually excited about doing his homework with my *Writing Assistant* and has become very proficient in correcting and editing his work. Patrick loves working with *MathBuild* (Soft Horizon) and the math program Jerry designed; I really feel that playing computer games has improved his concentration by requiring his undivided attention and active involvement.

Joey has outgrown *Kindercomp* (Spinnaker Software) and now relishes practicing his reading and spelling with my *Writing Assistant*. He really enjoys using *PrintMaster Plus* (Unison World) to make calendars and banners for his classroom and original signs and notes that delight his grandparents.

Chris, our 14-year-old, was as enthusiastic as Jerry was when we bought our 1000. He took a course in word processing and now writes poetry on the computer and keeps his own disk of all his work, including a daily journal. He has a special talent for expressing himself through writing, and I know that using the computer has stimulated Chris's creative side.

One aspect I really enjoy is seeing our family drawn together by the computer; with games such as *King's Quest* (Sierra On-Line, Inc.) and *Archon* (Electronic Arts), we've discovered that five heads really are better than one! Instead of spending evenings glued to the television, we interact with each other and save our viewing time for quality shows.

After 20 months of computer ownership, we have now reevaluated our career objectives and goals for our children's computer proficiency, and we're confident that these expectations will also be surpassed as we continue to learn and play together on our computer. ■

SEND US YOUR STORIES AND QUESTIONS

Please mail your questions or family profiles to FAMILY & HOME-OFFICE COMPUTING, *Attention: Family Computing Department Editor, 730 Broadway, New York, NY 10003. Essays should be no more than five pages, double-spaced and printed or typewritten, and demonstrate your family's use of the computer for a range of applications, such as working at home, personal finance, home management, education, and entertainment. If your essay is selected for publication, you will receive a software package for your computer.*

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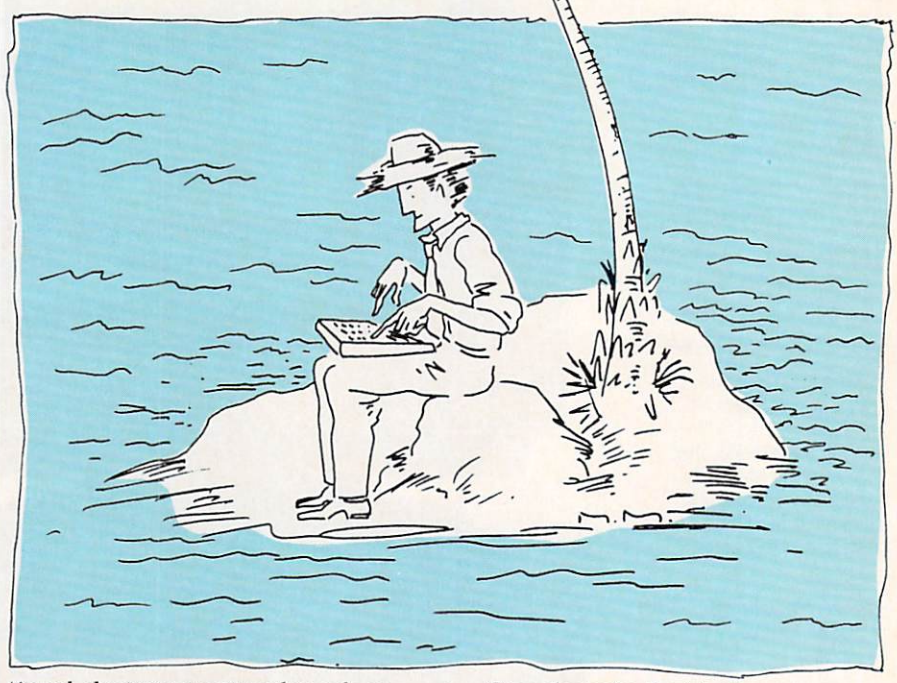
THE OFFICE AT HOME

NO LAPTOP IS AN ISLAND
Communication With Desktops: Choose Your Method

BY NICK SULLIVAN



Laptops are great. They can serve as an office in a briefcase. Wherever you go, you have access to your files and can work on them. (I'm on a train right now.) But there's one problem—what to do with your work when you're finished? What goes in must come out—but how?

Getting material out of a computer (or into it) is a problem for all users, of course. But it's not nearly as acute for desktop-computer users, who are generally set up (with a printer or a network) to immediately share their work with colleagues. Laptop users are lucky to get from one moving vehicle to another with all their equipment intact!

Fortunately, a number of new accessory products solve the nagging problems that laptop users face. These products include:

- Internal modems or pocket modems that you can unplug from your desktop and pack in a briefcase. Using a modem, you can send data directly to another computer via the telephone lines.
- Small printers that are light enough to carry on trips, if printouts are desired.
- Cable connection kits that allow you to transfer programs from 5.25-inch disks to 3.5-inch disks (and vice versa), which many laptops use.

Here's a quick rundown of some products in these categories.

MODEMS

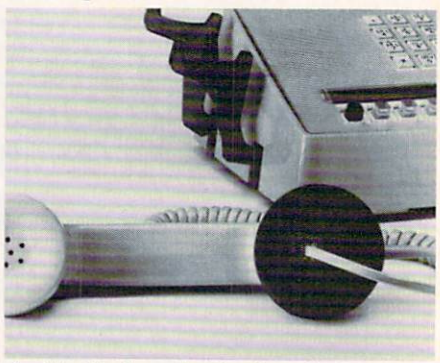
Virtually all laptop computers are sold with internal modems at least as an option (*see "Buyer's Guide to Portables" in the August 1987 issue*). A few—NEC MultiSpeed, Tandy 102 and 600, Kaypro 2000, Datavue Keystyle—come with built-in communications software.

You can use the modem and communications software to send text files (ASCII) to another computer—be it to your home office or to a national electronic network such as CompuServe. Sending binary files—with graphics or spreadsheet formulas—is considerably more complicated, though it can be done with the right software (*see September's Telecomputing department, which describes Dow Jones's* Desktop Express *and Lotus's* Express).

The advantages of an internal modem are that it takes up no room and is one *less* item to carry. The disadvantage is that it can't be used on another computer, such as your home or office desktop. But, if you want that flexibility, you can use a small, portable external modem.

The Volks Mini Modem (Anchor Automation; $199) and Novation Parrot 1200 ($135 with cables; $119 without) are small units that draw power from the telephone line. The Parrot 1200 weighs a mere six ounces. The WorldPort 1200 Portable Modem (Touchbase Systems; $199) and the Migent Pocket Modem ($259) are battery powered. All will fit in a shirt pocket and simply plug into your laptop's RS-232 serial port. All are Hayes compatible and work with most communications software.

One obstacle that laptop communicators face is hard-wired phones in hotel rooms, which means they can't plug the modular phone jack into a phone outlet. The solution is



The Blackjack, a plug-in phone jack

Blackjack (Microperipheral Corp., $50), a device that replaces the mouthpiece on the phone handset and has an outlet for a modular jack.

PRINTERS

A computer without a printer can be a limited system. Most people who use a desktop computer on a regular basis have a printer. Conversely, most people who travel with

ILLUSTRATION BY MONA MARK

NICK SULLIVAN, *a senior editor of* FAMILY & HOME-OFFICE COMPUTING, *wrote this article on a laptop, then transferred it to his desktop (via null modem) to edit and print out.*

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laptops work *without* printers because they're too heavy and unwieldy to carry around. But for users who need to travel with printers, there are options.

The quiet Diconix 150 ($479) is an ink-jet printer. It weighs less than four pounds and prints 150 cps in draft mode, 50 cps in NLQ. It has an AC adapter, but can produce about 150 pages on a set of rechargeable batteries.

Brother's line of EP Personal Printers costs from $199 to $449 and each weighs just five pounds.

These printers produce adequate output, but the printouts can't compare with those of "desktop" printers in the same price range. In other words, you shouldn't expect these printers to perform as your primary printer would.

CABLE CONNECTIONS

All laptops that have disk drives have 3.5-inch drives. Most desktops in use have 5.25-inch drives. Thus, many people who'd like to take a desktop program and run it on their portable (or vice versa) may be stymied—at least temporarily. But there are several programs that enable you to convert the data.

Traveling Software's *Lap-Link* ($130), White Crane Systems's *The Brooklyn Bridge* ($130), and Micro-Z's *Direc-Link* ($92) are kits designed to speedily transfer data between different MS-DOS disk formats.

Each kit includes a cable that connects the serial ports on both computers and also two pieces of software—one in 3.5-inch format and the other in 5.25-inch format. Once the computers are connected, you can transfer full programs (such as word processors and spreadsheets), binary files, and ASCII files at extremely high speeds. Transferring a sizeable program such as *WordStar* takes only a few minutes.

Finally, the Zenith Z-183 computer has an optional software kit that transfers data from 5.25-inch to 3.5-inch disks and vice-versa. You'll have to buy a cable, however.

NULL MODEMS

If you just need to transfer ASCII files—such as those created with a word processor—you can use a null-modem cable. A null-modem cable is simply a serial cable in which the wiring has been slightly altered. At ComputerLand and other electronics outlets, you can buy null modems for about $45. Radio Shack sells null-modem adapters ($10) that convert standard serial cables. However, not all null-modem adapters work with all computers.

With the two computers connected by the null-modem cable (serial port to serial port), you load communications software on both computers. Place both computers in terminal mode and set up your desktop to receive a file. You can then send a file from your laptop.

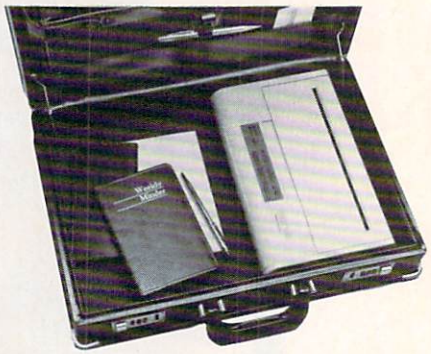
People who want to transfer data from a Tandy Model 100 or 102 to a Macintosh will find that the Apple ImageWriter I printer cable serves as a null modem. This is one of those nice coincidences that almost never occurs in computing.

COMPLETE THE GESTURE

If you're thinking of buying a portable, describe to yourself exactly how you want to use it. Try to buy enough equipment initially to create a workable system; otherwise you'll suffer indescribable indignities (such as manually copying your files from screen onto paper) that may not have been avoidable a few years ago, but certainly are now.

In many cases, it will make sense to buy a laptop with an internal modem and built-in communications software. That way, you'll always have one easy outlet for most of your files—and you won't have to carry any extra equipment. In an electronic world, why not send electronic mail to the people you want to reach?

If you travel and present prepared speeches, you'll probably want a portable printer to complement your laptop. That way, you can compose speeches on the plane or in the hotel and get an immediate printout. Without the printer, you may as well outline your notes on paper.

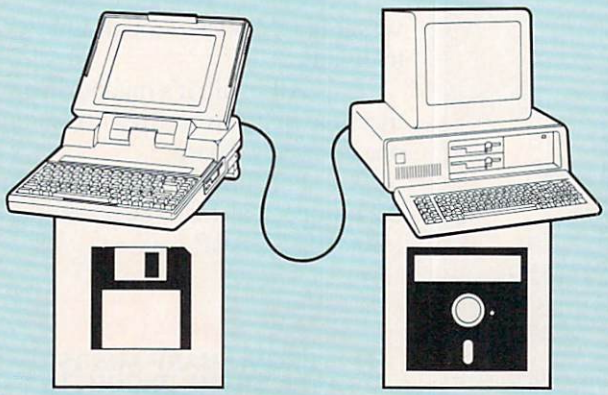


The portable Diconix 150, an ink-jet printer

If you have a library of 5.25-inch software and would like to use it on a laptop, you'll need one of the connecting-cable kits. On some laptops you can connect an external 5.25-inch disk drive to transfer or run software, but that's a much more expensive option than a cable.

Of course, today's laptops are powerful enough to be used as primary computers, not just adjuncts to bigger systems. But even if that's the case, you'll still have to communicate with desktops. That's the way the world works. ■

TRANSFERRING DATA



To transfer complete programs, such as a word processor, from your desktop to laptop (or vice versa), you run a null-modem cable from serial port to serial port. Each computer has special software (3.5-inch format for the laptop and 5.25-inch format for the desktop) to effect the transfer. *(Diagram courtesy of White Crane Systems, makers of* The Brooklyn Bridge.*)*

COMPANY PHONE NUMBERS

Anchor Automation, (816) 997-7758; Brother, (201) 981-0300; Datavue, (404) 564-5555; Diconix, (513) 259-3100; Kaypro, (619) 481-4300; Microperipheral Corp., (206) 881-7544; Micro-Z, (213) 377-1640; Migent, (702) 832-3700; NEC Home Electronics, (312) 860-9500; Novation, (818) 998-5060; Tandy/Radio Shack, (817) 390-3011; Touchbase Systems, (516) 261-0423; Traveling Software, (206) 483-8088; White Crane Systems, (404) 394-3119; Zenith (312) 699-4800.

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TAKE THE EASY STREET TO WALL STREET
What Investors Like Most About Choosing, Managing, And Trading Stocks Via Computer

BY JACK HAYES

Many people who invest in the stock market know that there's much to be gained from using computers. One of the most notable gains is time.

"If you're gathering and calculating stock data, you can't do it fast enough manually," said investor Dale Scott. Working from his Wilton, Connecticut, home, Scott can simultaneously monitor 20 stocks on one of his two IBM PC compatibles, downloading data for closer analysis in the evening. "Manually, it would take me days to do this," he said.

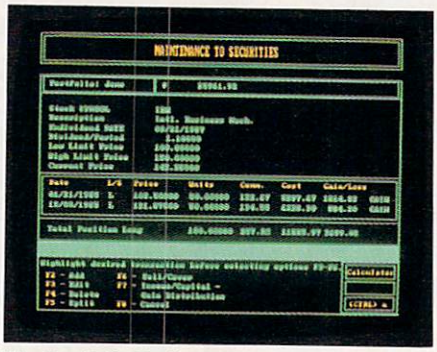
"I used to spend eight days a week posting charts," said another seasoned investor, who tracks 350 stocks daily and does all of her trading from home in New York. "Before the computer, it took every ounce of my energy to follow just 50 stocks."

The computer can be just as important to small-time investors. While many full-time businesspeople welcome the chance to become investors, their days are otherwise consumed by careers that override market watching and frequent phone calls to brokers. In the evening, using their personal computers, investors can review their holdings, look for new opportunities, double-check their brokers' tips, and even place orders.

For instance, using his Tandy 1200 and a modem, lawyer Jim McLain, of Atlanta, Georgia, reads stock-closing prices, accesses financial news and analyses, reviews his portfolio, and sends messages that are read the next day by his personal account manager at E.F. Hutton, a brokerage house. "I'm getting financial news off the computer at night—instead of reading it in the morning paper," said McLain.

MANAGEMENT, ANALYSIS, AND EDUCATION

Just about anyone who invests even modestly can use the computer to his or her advantage. But if you're a new investor, you should enter into the world of stocks with your eyes and ears wide open. Proceed with the same caution you would if you were crossing a frozen river in total darkness. The nice thing about software is that you can play with it—until you feel confident enough to put your money on the line.



***The Portfolio Evaluator* (Financial Applications), shown here, is for owners of C 64s and IBM PCs and compatibles.**

There are hundreds of software packages for the individual investor, from simulator games that introduce novice tycoons to the workings of the markets to analytical programs that help investors choose the right stocks and the right times to buy or sell. Or with the help of spreadsheets and integrated programs like Lotus *1-2-3* and *Symphony*, you can keep track of transactions, chart expenses, measure earnings, compare performances of stocks, bonds, and mutual funds, plan your entire investment strategy, and do much more.

Choosing the right software for your personal-investment analysis and accounting will depend on the kind of computer you own, the amount of money you can spend—and the amount of investing you actually do. The American Association of Individual Investors (AAII), a Chicago-based group of more than 100,000 investors, lists several hundred software products in its most recent book, *The Individual Investor's Microcomputer Resource Guide* (available to nonmembers for $15.95 by writing to AAII, c/o Dept. FC, 612 North Michigan, Chicago, IL 60611). A third of AAII's members are now using personal computers for investment purposes.

Investment software is written for either record keeping or analysis. Record-keeping — or portfolio-management — programs allow you to keep track of your investments and often let you prepare and print out reports. Portfolios can also be managed with a spreadsheet program like Lotus *1-2-3* or an integrated package like *AppleWorks*. Nearly half of AAII's 35,000 computer users polled in a recent survey were using *1-2-3* for portfolio management or stock analysis.

Analytical software helps you select investments and the best times

PORTFOLIO-MANAGEMENT PROGRAMS

These programs perform the investor's financial record keeping (cost, earnings, and tax and expense accounting) from manually entered or downloaded data.

DESIRED FEATURES:

On-line downloading capability
Flexible accounting capability (bonds, options, funds)
Integration with analysis software
Year-end reporting
Portfolio-performance monitoring

PROGRAMS:

Equalizer, from Charles Schwab & Company; $199; Apple and IBM PC. A portfolio manager that allows you to place your own trades and get stock-market information on-line.

The Isgur Portfolio System, from Batteries Included/Electronic Arts; $200–$246; IBM PC and Macintosh. Designed by Wall Street financial analyst Lee Isgur, this program allows you to structure and display your investment data.

The Portfolio Evaluator, from Financial Applications; $40–$80; C 64/128 and IBM PC. Retrieves stock quotes from Dow Jones News/Retrieval and Warner Computer Systems and includes a comprehensive portfolio-management system.

JACK HAYES, *a freelance writer living in Atlanta, Georgia, co-authored "The Computer and the Phone" in our September 1986 issue.*

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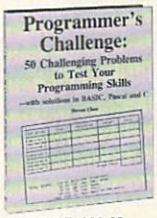

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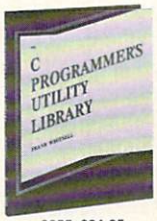

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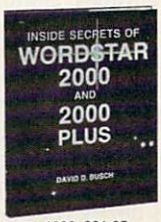

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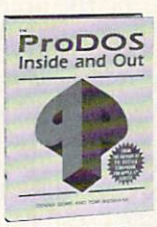

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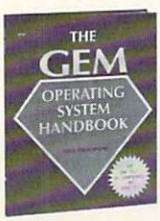

2742 $23.95

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1997 $21.95

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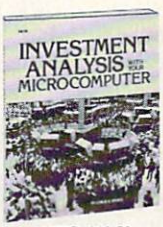
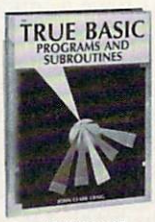


1479P $13.50

2730 $27.95
Counts as 2



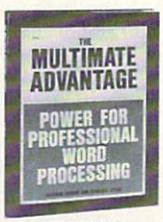
1990 $24.95

2791 $21.95

All books are hardcover editions unless numbers are followed by a P for paperback.

(Publishers' Prices Shown)

2692 $27.95
Counts as 2

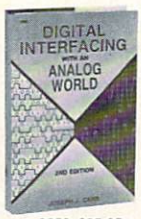


2793 $22.95

2654 $18.95

2840 $24.95

2872 $19.95



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to buy and sell them. Fundamental analysis is a strategy for picking individual stocks based on financial data about the company as well as current economic conditions. Technical analysis is an elaborate way of looking at the overall market in order to pinpoint key times for buying and selling those same stocks. Some analysis programs also handle portfolio management. They can cost more than $1,500 for the ultrasophisticated *Insight* (Bristol Financial Services, Inc.) and *Swing Trader* (The Pardo Corporation) or as little as $80 for the very basic *Portfolio Evaluator* (Financial Applications). Somewhere in the middle, you'll find a program like *Market Analyzer* (Dow Jones & Company), which costs $300–$350.

Even software games can give new investors a better feel for the environment and language of investments. *The Financial Time Machine* (Lehner Communications) teaches you the sensitivity of market prices to economic conditions, while *COMEX: The Game* (Commodity Exchange) teaches options and futures trading in the gold, silver, and copper markets. *(Also, see the review of* The American Investor, *a simulation of the American Stock Exchange, in this issue.)*

INVESTING ON-LINE

And if you have a modem and communications software, you can go on-line with business news services, financial databases, and brokerage houses. This is made possible through a number of financial information service providers like CompuServe, Dow Jones News/Retrieval, Newsnet, I.P. Sharp Associates, Telenet America, Inc., and Warner Computer Systems, all of which offer news and financial services to home investors via personal computers.

A modem can open up the world of instant stock quotes, newsletters, research, and reports by enabling you to trade from home. You can turn on your computer after dinner, use your modem to dial a phone number and go on-line, and read the closing prices of all your stocks.

One Alaskan college administrator uses an IBM PC, *Symphony* from Lotus, and a modem to analyze stocks and place orders for about 10 trades a week, using a broker who lives in San Francisco. He's thrilled to be able to place his orders electronically at a convenient hour—considering the time difference between Wall Street and the Pacific Northwest.

INVESTMENT HARDWARE: APPLE OR IBM?

If you're an investor who's computerized recently, you may have discovered that the majority of investment software is written for either Apple IIs, IBM PCs and compatibles, or Macintoshes.

Marylee MacDonald, a research associate from Urbana, Illinois, owns a Kaypro computer but keeps her investment records with a pencil and paper. She tells people that she's too lazy to spend a couple of hours every night updating her investment portfolio. Unlike most investors who can't recall how they got along without the computer, she argues: "It's just as simple keeping records with a pencil."

Yet in the next breath, MacDonald admits that using her computer for investment accounting and analysis would be a lot easier if she had a Macintosh or an MS-DOS computer (her Kaypro is a CP/M machine) and a top-of-the-line software package.

Fortunately for MacDonald, she's a long-term investor and not a frequent trader at this time. "Otherwise, I'd have to spend the money right away for an IBM PC or a Mac," she said. Until that day comes, she'll carry a chart in her purse and make her once-a-week phone call to see where her investments stand. "It's worked out all right so far in the bull market," she said.

Those who continue avoiding the computer will spend more time at the kitchen table with pencils, paper, and calculators—and more time on the phone with brokers—than will their computer-using counterparts.

Investors who use the computer insist that a computer isn't going to make you a smart investor any more than a camera is going to make you a talented photographer. Just as you learn to take good pictures by taking pictures, you learn how to make good investments by investing. ■

ANALYSIS PROGRAMS

Fundamental-analysis software helps the investor pick stocks, generally for long-term holding, based on qualitative performance characteristics.

Technical-analysis programs help find trading opportunities for stocks based on abstract market characteristics revealed in charts and graphs.

In both types of analyses, data can be manually entered, screened from data disks, or downloaded from on-line financial information services.

DESIRED FEATURES:
On-line capability
Valuation ranking
Integration of fundamental-technical software
Color graphics
Graph-printing capability

PROGRAMS:

The Economic Investor, from ECON; $249–$399, updated annually for $100; IBM PC. A database of statistics developed from the price movements of 600–1,200 stocks and the movements of seven key economic variables over the last 10 years.

Market Analyzer, from Dow Jones & Company; $299–$349; Apple, IBM PC, and Macintosh. Performs stock-market analysis using data from Dow Jones News/Retrieval and then constructs charts that reveal price and volume fluctuations.

TAS-64, from Abacus Software; $40–$60; C 64 and C 128. Menu-driven program that downloads information from Dow Jones News/Retrieval and Warner Computer Systems.

Trendline II, from Standard & Poor's Corporation; $245; Apple and IBM PC. Charts stocks, indexes, and mutual funds from the Warner Computer Systems database for technical analysis.

Value/Screen Plus, from Value Line Inc., $211–$348; Apple and IBM PC. A stock-evaluation program that accesses Value Line's database of records for more than 1,600 stocks.

PUBLISHERS' TELEPHONE NUMBERS

Abacus Software (616) 241-5510; Bristol Financial Services (203) 454-4181; Charles Schwab & Company (415) 627-7514; Commodity Exchange (212) 938-2000; Dow Jones & Company (609) 452-1511; ECON (212) 529-3255; Electronic Arts (415) 571-7171; Financial Applications (713) 947-2899; Lehner Communications (312) 432-5458; The Pardo Corporation (312) 492-3500; Standard & Poor's (212) 208-8000; Value Line (212) 687-3965; Warner Computer Systems (201) 489-1580.

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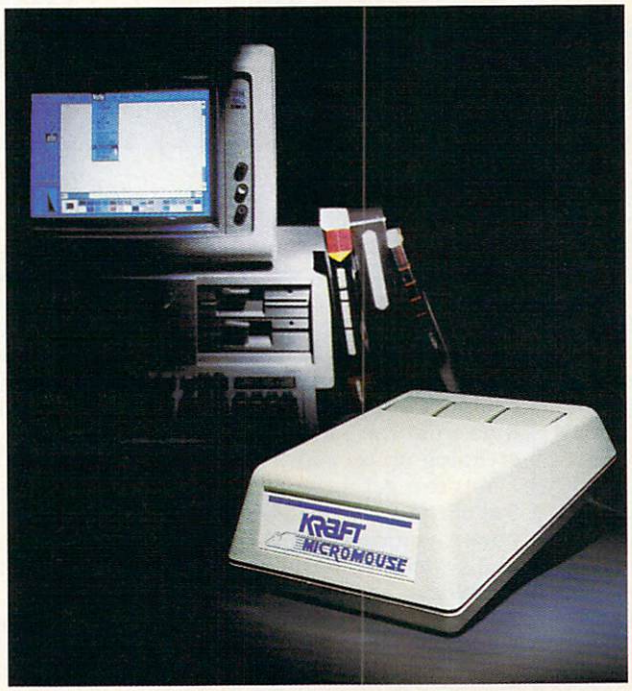

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CIRCLE READER SERVICE 20

TELECOMPUTING

BUYING A NEW CAR? Before You Joust With a Dealer Kick the Tires on CompuServe

BY NICK SULLIVAN

Shopping folklore says you need a car to buy a car. I say you need only a modem.

Researching a car purchase involves a great deal of cruising from lot to lot, collecting prices and specifications (all while pretending that you're relaxed and in no need of a car). Then, armed with the facts and a good feel for where your needs meet the market, you negotiate with the dealer from a position of strength.

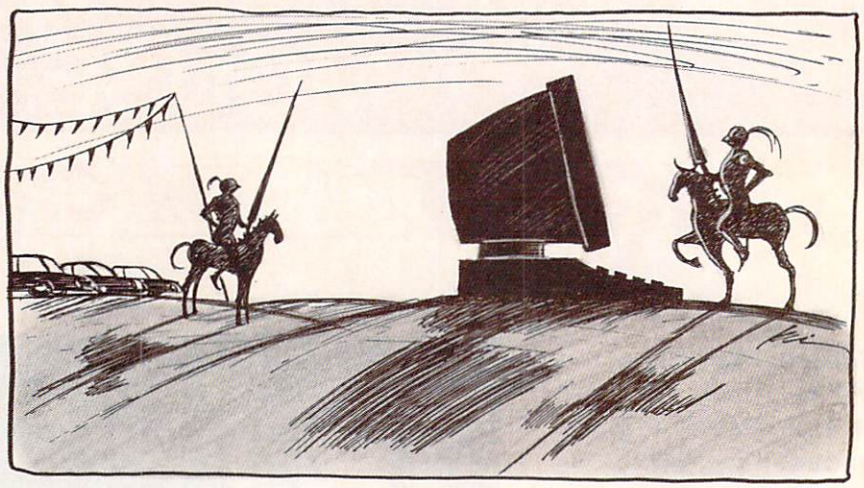
But rarely is life so orderly. You may be desperate for a car, especially if your previous buggy decomposed faster than a pile of wet leaves (as mine did). You're trying to squeeze in your car-lot education at night, between your work and home responsibilities. And the thought of spending so much money wracks your nerves until the ordeal is over. Next to buying a house, social psychologists say buying a car is the most stressful thing an American consumer does.

A modem and a CompuServe subscription can dispel much new-car buying anxiety. By visiting the "New Car Showroom" (GO NEWCAR), you can research 500 car and van models (and 60 trucks) from home and get a complete printout of prices, standard features, and options. This allows you to study an objective sheet rather than a dealer's handout.

Did I do this when I bought a car last spring? "But noooo," as John Belushi used to say. I was so nonplussed that I drove around like Conan the Barbarian in a bumper-car movie, bouncing from dealer to dealer. Only after I bought the car did I relax and discover CompuServe's showroom. It's terrible: I had to buy something in order to learn how to shop.

SO SIMPLE IT'S ADVANCED

The "New Car Showroom" on CompuServe is simply constructed and simple to use—so simple it's advanced. You can find the manufacturer's suggested retail price for virtually any model, as well as a listing of standard and optional features. (There's a $.90 surcharge beyond CompuServe's regular connect rates to list the features of one car and a $1.20 surcharge to compare two cars.) The virtue: You don't have to decipher stickers while trying to hide from the salesperson who's creeping up on you.



You can get a comprehensive listing of the car's makeup—horsepower, compression ratio, torque, fuel system, steering diameter, and wheelbase, for instance. The virtue: If you know anything about cars, you can make informed decisions; if you don't know anything, these statistics won't injure you. The helpful "Terminology and Abbreviations" section explains some of the specs.

Do you know what you're looking for? Choose a specific price range, an Environmental Protection Agency automobile classification (such as compact or subcompact), the number of doors, type of transmission and driveshaft, and desired fuel economy, and CompuServe will provide you with a list of vehicles that match your specs. The virtue: You save yourself from weeks spent clipping magazine ads, questioning friends, and cruising car lots.

After you price a car, you can calculate your monthly payments—just supply the purchase price, the down-payment, an interest rate, and the length of the loan. The virtue: Without buying a fancy calculator, you'll quickly see how much bread and water you'll be able to afford every time you drive your shiny car to the supermarket.

Useful Tip #1: When it's time to negotiate, use this loan calculator to double-check the car dealer's figures. I did it with a hand-held calculator and discovered a $20 per month discrepancy—in my favor. The dealer said he had included "default insurance for my protection." Of course I didn't want it.

DRAG PRICING

All of this information is valuable and conveniently available from your computer terminal. But it pales next to the side-by-side pricing function, (*see sample printout*) which I have come to call "drag pricing." Some cars really are left at the starting line when you match chrome plate against chrome plate.

What you're doing when you pick any model from any manufacturer and match it against any other car is really making good use of a huge computer. (It's CompuServe's, not yours.) You don't have to be Einstein to know that manufacturers price cars differently; but you usually can't tell what you get for your money without a lot of research—or a computer and a modem.

CompuServe shows, line by line, what's standard, what's optional

NICK SULLIVAN, *a senior editor for* FAMILY & HOME OFFICE COMPUTING, *wrote "Electronic Mail: Two Steps Forward" for last month's Telecomputing column.*

ILLUSTRATION BY KEIKO MATSUMOTO

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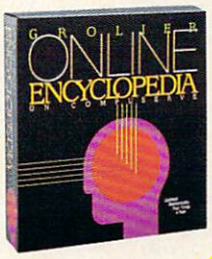

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CIRCLE READER SERVICE 8

(and how much it costs), and what's *not* available. It shows which car has the most legroom, headroom, power—or whatever turns you on.

The best use of this powerful function is to choose two cars that interest you and are close in price. Make a printout so you can conduct a careful comparison study. One car may be more expensive, but it may deliver the glitter (options such as an FM stereo, tinted windows, or interval wipers) that says "you." Move on to the loan calculator and run some numbers. You'll have to go without bread several days a month? Go back to the printout and start chopping options.

Useful Tip #2: The car dealer assumes you know nothing, and he or she may be right. But if you know that one dealer is charging you for a rear defogger, while a competitor down the block is throwing it in free, you can begin to talk turkey. Dealers respond to this (they have no choice), especially if they're selling cars that compete for the same market. I received a free cassette deck and an extended warranty from one dealer because another one was giving away five-year warranties on a rival wagon.

A LITTLE AUTO-FANTASY

If you become stymied, you can relax, like me, and play a little "what if." Part of the "New Car Showroom" includes a five-question quiz designed to match you with the perfect car. It's not as useful as the rest of the showroom, but a good place to limber up before a purchase and wind down after one.

To each question, you answer with a number from 1 to 5, with 1 meaning "not important" and 5 meaning "very important." It helps to imagine yourself driving down Highway 1 in California. Start your engines, please!

CARRY 5+ PEOPLE? 1
TOW LARGE TRAILER? 1
HIGH PERFORMANCE? 5
LOW INITIAL PRICE? 1
COMFORT & ROOMINESS? 3
ANSWER: Corvette, $27,999 (excluding options).

Now go to the loan calculator and burn some rubber (I mean, run some numbers). ■

COMPUSERVE INFORMATION

Available from The CompuServe Information Service, CompuServe Inc., 5000 Arlington Centre Blvd., Columbus, OH 43220. For more information, call (800) 848-8199. In Ohio and Canada, call (614) 457-0802.

COMPARISON SHOPPING

On CompuServe's "New Car Showroom" (GO NEWCAR), you can choose two cars from a list that matches your desired price range, size, body style, and type of transmission. Then, you can run a side-by-side comparison of base price, technical specifications, and cost of options. Single options that are listed without prices, such as the tachometer or digital clock, are often included in other feature packages.

```
Manufacturer is FOR - FORD

Choose a model by number (1- 53 )
or L for List! 10
Choose Second Manufacturer:

Mfr. Code or L for List! cvy

Manufacturer is CVY - CHEVROLET

Choose a model by number (1- 80 )
or L for List! 19
Manufacturers:
                    FOR - FORD                CVY - CHEVROLET
                    ========================= ====================
Models:
                    TEMPO GL                  CAVALIER RS SEDAN

Press <CR> for Details!
(Surcharge is $1.20)
or M for Menu!

[[[[ BASE PRICES (MFR. LIST) ]]]]
(includes destination)

                    FOR - FORD                CVY - CHEVROLET
                    ========================= ====================
                    2DR 5SP - $8558           4DR 4SP NBK - $8899
                    2DR AUTO - $9040          4DR 5SP NBK - $8974
                    4DR 5SP - $8708           4DR AUTO NBK - $9389
                    4DR AUTO - $9190          (Dest. Chg.) - $400
                    (Dest. Chg.) - $398

[[[[ TECHNICAL SPECIFICATIONS ]]]]

                    FOR - FORD                CVY - CHEVROLET
                    ========================= ====================
Curb Weight         2462/2515(4D)             2398
Weight Distribut.   62/38                     64/36
Wheelbase           99.9                      101.2
Track               54.9/57.6                 55.4/55.2
Length              176.5                     174.3
Width               68.3                      66.3
Height              52.7                      52.1
EPA Trunk           13                        14
Fuel Capacity       15.4                      13.6
Seating             5                         5
EPA Classification  COMPACT                   COMPACT
EPA Volume          89                        91
Headroom Front      37.5                      39.7
Headroom Rear       36.9                      38.0
Legroom Front       41.5                      42.9
Legroom Rear        36.0                      32.2
Hiproom Front       48.8                      48.8
Hiproom Rear        51.4                      48.9
Base Engine         2.3L4 HO                  2.0L4
Displacement        2311/141                  1983/121
Bore/Stroke         3.70 X 3.30               3.50 X 3.15
Compression Ratio   9.0                       9.0
Horsepower          86 @ 3800                 90 @ 5600
Torque              120 @ 3200                108 @ 3200
Fuel System         SPFI                      FI
Alter. Engine 1     N/A                       N/A
Alter. Engine 2     N/A                       N/A
Steering Diameter   38.7(a)                   34.7
Economy Manual      22/30                     25/33-25/34(5S)
Economy Auto.       22/27                     24/31
Manual Transmiss.   5SP                       4SP/5SP (W/OD)
Auto. Transmiss.    3SP                       3SP
Engine/Driveline    FE/FWD                    FE/FWD
Brakes              DISC/DRUM                 DISC/DRUM
Steering            RACK & PINION             RACK & PINION
Suspension          IND/IND                   IND/LIVE
Tires               SBRP185/70R14             SBRP195/70R13
Tailgate            N/A                       N/A

[[[[ FEATURES ]]]]

                    FOR - FORD                CVY - CHEVROLET
                    ========================= ====================
Power Steering      STANDARD                  STANDARD
Power Brakes        STANDARD                  STANDARD
Tour Susp Upgrade   NOT AVAILABLE             NOT AVAILABLE
Sprt Susp Upgrade   NOT AVAILABLE             NOT AVAILABLE
Alloy Wheels        NOT AVAILABLE             OPTIONAL $212
Electric Sunroof    NOT AVAILABLE             NOT AVAILABLE
Manual Sunroof      NOT AVAILABLE             OPTIONAL $350
Tinted Glass        OPTIONAL $120             OPTIONAL $105
Full Size Spare     NOT AVAILABLE             NOT AVAILABLE
Halogen Lamps       STANDARD                  OPTIONAL $25
Manual Air Cond.    OPTIONAL $773             OPTIONAL $675
Auto. Air Cond.     NOT AVAILABLE             NOT AVAILABLE
Power Windows       OPTIONAL $222/296[4DR]    OPTIONAL $285
Cruise Control      OPTIONAL $176             OPTIONAL $175
AM Radio            STANDARD $-65             STANDARD $-56
AMFM Radio          OPTIONAL $93              OPTIONAL $207(1)
AMFM Cassette       OPTIONAL $278             OPTIONAL $329(1)
AMFM Premium        OPTIONAL $416             OPTIONAL $479(1)
Split Seats         STANDARD                  STANDARD
Electric Seats      OPTIONAL $251             NOT AVAILABLE
Recline Seatback    STANDARD                  STANDARD
Tilt Steering       OPTIONAL $124             OPTIONAL $125
Interval Wiper      STANDARD                  OPTIONAL $55
Power Locks         OPTIONAL $237/288[4DR]    OPTIONAL $195
Rear Defogger       OPTIONAL $145             OPTIONAL $145
Tachometer          OPTIONAL                  OPTIONAL
Analog Clock        NOT AVAILABLE             NOT AVAILABLE
Digital Clock       STANDARD                  OPTIONAL
Roof Rack           OPTIONAL $115             OPTIONAL $115

[[[[ FOOTNOTES AND PACKAGES ]]]]

FORD TEMPO GL
 NGL: SELECT GL PACKAGE: TG,FR,ETC - $191
 PEG: POWER EQUIPMENT GROUP: PL,PW,EA,ETC - $560/6[4DR]
 CVG: CONVENIENCE GROUP: CC,CA,HI,TS,ETC - $671
 SIC: SPORT INSTRUMENT CLUSTER: TA,ETC - $87
 a-RIGHT SIDE STEERING DIAMETER IS 38.2

CHEVROLET CAVALIER RS SEDAN
 EIC: ELECTRONIC INSTRUMENT CLUSTER: TA,ETC - $295
 1-Includes DC
 a-AVAILABLE WITH SOME RADIOS
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Help youngsters turn learning the basics into lots of fun.

EduWare's tutorial approach emphasizes the fun of learning. Hundreds of words and pictures help little Wendy learn to read in ***Spelling and Reading Primer***™ (for ages 4–8). And lively animation and catchy tunes hold her attention as she learns counting, comparing shapes, measuring — even simple addition and subtraction — in ***Introduction to Counting*** (for ages 4–8).

DesignWare's entertaining software grows with your children — to keep learning alive. Juanita improves word recognition and spelling with ***Spellicopter***,® a fast-paced helicopter rescue game (for ages 6–10). And she learns to think fast as she masters arithmetic facts with ***Math Maze***® (for ages 6–11).

Give teens a homework advantage.

Skip starts out as cub reporter and works his way up to editor-in-chief in the fun-filled ***Grammar Examiner***.™ And he becomes as knowledgeable as a seasoned U.S. traveler with ***States & Traits***.™ (Both programs are from **DesignWare** and both are for ages 10 & up.)

EduWare's *Algebra Series* offers Bill a serious — and very effective — tutorial approach to high school algebra. He'll start with ***Algebra I*** and work his way through the entire series.

Let the whole family get down to business

Home productivity software from **DesignWare Plus** makes the business of living a whole lot easier. Mom can write letters, tally numbers, and prepare mailing lists with ***W.O.R.K. at Home***.™ She learned it quickly and finds it easy to use. Candace uses ***Remember!***™ to help her memorize important facts — so she can ace those college exams.

Blue Chip Software's fun-filled simulation software teaches the ins and outs of investing. Uncle John gets his feet wet in the stock market (without taking a financial bath) with ***Millionaire II***.™ Nancy Brent, next door, is discovering how to build her fortune in real estate with ***Baron***.™ And Grandpa uses ***The American Investor***,™ The Official Simulation of the American Stock Exchange, to understand the best strategies for managing his investment portfolio.

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Public Libraries Are Making Computers and Software Available to Cardholders

BY SALLY CROUCH

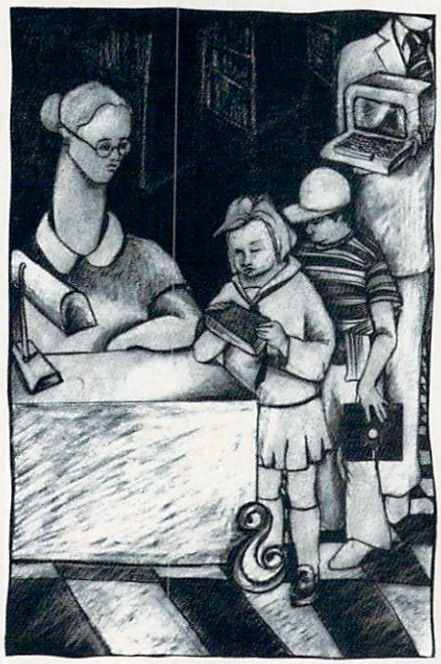
If you've visited a public library within the last couple of years, you may have noticed a new type of resource available—the personal computer. A growing number of libraries are adding software to their stacks and setting up computer centers for public use. Preschoolers can play with such games as *Early Games for Young Children*, students can use word processors to enter material from reference books, and M.B.A.s can use the libraries' printers to produce graphs for the next day's presentations.

Since the late 1970s, libraries across the country have been making computers and software available to cardholders. Now, more than 43 percent of the country's public libraries that individually serve more than 25,000 users provide public access to computers.

WHY GO TO THE LIBRARY?

Public-access computers make computer technology available to just about anyone. The library is a great place to sample a machine or a piece of software that you don't have at home. It's a quiet place to complete work that was started at school or at the office, and also a place to go if your computer at home is tied up for the evening and you want to write a letter or play a new game. Or, if you need a letter-quality printout of a file but only have a dot-matrix printer, check to see if your library has a letter-quality printer that you can use. At some libraries, you can even take a library-sponsored computer course, join a library computer club, or sign up to receive a computer newsletter prepared by the staff.

SALLY CROUCH, *a former computer programmer, is a freelance writer and English teacher. Her master's thesis was entitled "Using Microcomputers to Teach Second Languages."*



Testing hardware and software at the library before buying is one of the best ways to avoid costly mistakes. You can get a feel for different systems and compare software without pressure from salespeople. My husband, Bob, who is a programmer, is interested in learning more about databases and plans to visit a library to try out Lotus *Symphony* or another high-level package that integrates graphics, word-processing, and spreadsheet and database functions. By dabbling with the library's software, he will get a good idea of what program best suits his needs and whether or not it's worth buying.

If a computer, a printer, or an expensive software package is on your wish list, it's probably worth an hour or two of your time to check the library's selection before you buy.

Frequently, the libraries purchase IBM PCs or Apple IIe's with 20 or 30 software packages and put them in specially designated areas. Then, they'll let cardholders sign up for a half-hour to two-hour time slot. Some charge a minimal fee for using their computers in the library.

The Tredyffrin Public Library in Strafford, Pennsylvania, for instance, charges a dollar for each half hour that you use its computers. The Nashua Public Library in Nashua, New Hampshire, charges the same, but you'll need quarters for its coin-operated computers.

Some libraries even let cardholders take computers and software home. At the Cloquet Public Library, near Duluth, Minnesota, borrowers need both a library card and a driver's license (to verify that the borrower is at least 16 years old). The library has three computers and a printer that a family can take home for 24 hours or for the weekend. Although the software is free, computer rental is $5–$10, depending on the system and equipment you choose.

TESTING HARDWARE AND SOFTWARE AT THE LIBRARY BEFORE BUYING IS ONE OF THE BEST WAYS TO AVOID COSTLY MISTAKES.

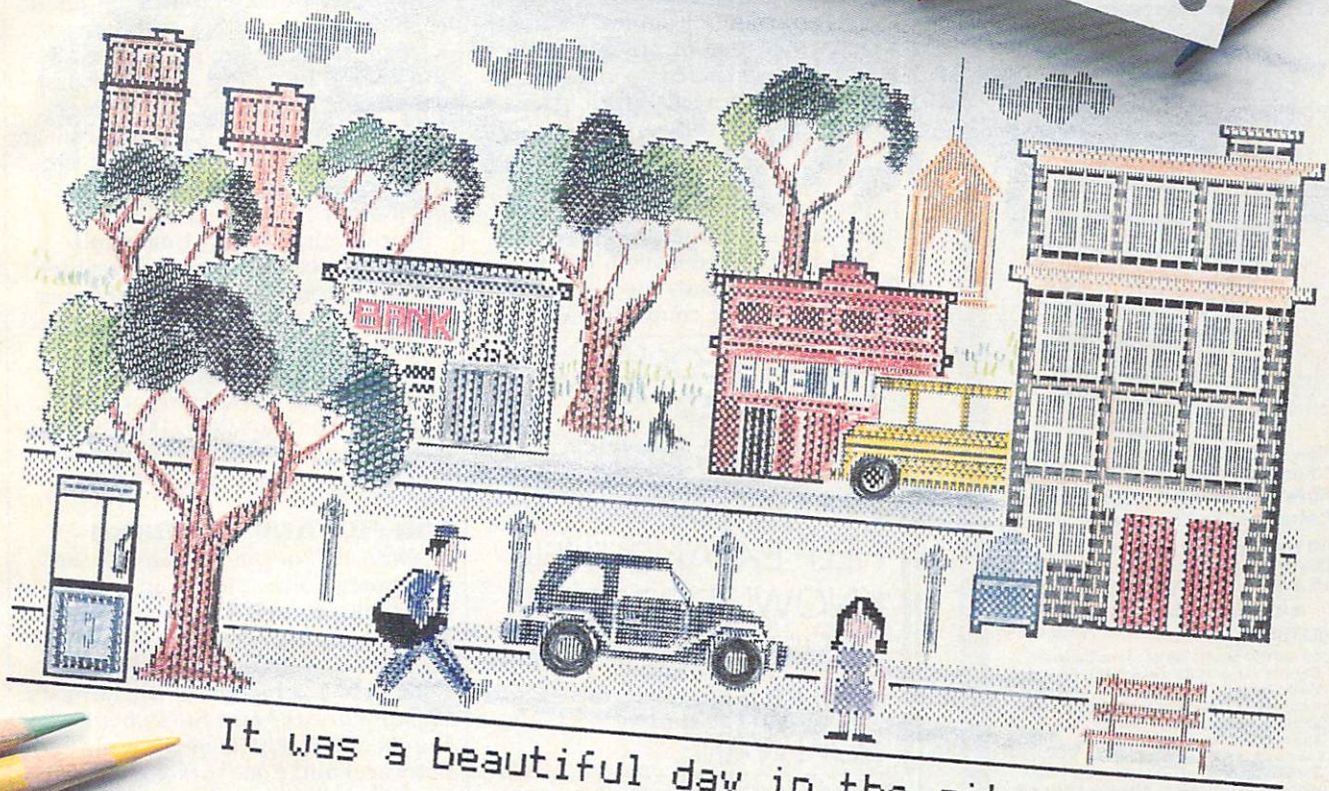
A TYPICAL LIBRARY COMPUTER CENTER

My family often visits one of the "Computer Connections" at Prince George's County Memorial Library System in Maryland. The library system has "Computer Connections" in four of its 20 branches and two more are expected to open by the end of this year.

Each Connection has about 65 software packages and three com-

ILLUSTRATION BY THERESA KING

Ages 6-12



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HOME-SCHOOL CONNECTION

puters: an Apple IIe, a Macintosh, and an IBM PC, each with its own dot-matrix printer. Software is categorized as either home/educational/games, training, graphics, database, word processing, or programming languages, so there is something to suit everyone's needs. Use of the computers and software is free, but you must pay for supplies such as disks ($3.00–$5.50 each), printer paper (one cent per page), and address labels (12 for two cents).

Many of the people who use the Connections already are familiar with at least one computer system.

MANY PEOPLE USE THE LIBRARY'S FACILITIES AND TRAINED STAFF TO HELP EXPAND THEIR KNOWLEDGE TO OTHER MACHINES AND NEW SOFTWARE.

They use the library's facilities and trained staff to help expand their knowledge to other machines and new software. It's a convenient way to explore new options.

Your kids might discover that a word-processing package can be a big help with term papers and reports. A graphing program may be just the answer to next week's science project. You may even discover a package that will help you pick up a second language or learn about the stock market.

Another benefit of being at the library is that there is always a library aide ready to help if you get in over your head. If, for example, you run into trouble creating a batch file or printing a graph, an aide can quickly find the right page in the proper manual or walk you through the procedure step-by-step. For this reason, the library can also be an excellent starting place for people who aren't very experienced with computers. If you have friends who are eager to learn, but you don't have the time to spend with them yourself, suggest that they try the library.

Carl Keehn, co-captain of the Laurel Computer Connection, said, "People come in and say, 'Here I am. Can you show me how to do this with a computer?' " He or one of the other aides explains a little bit about each of the computers and then keeps a close eye on beginners, offering helpful hints to make their first experience productive. First-timers are also required to run a tutorial program to learn about each of the different computers and its operating system.

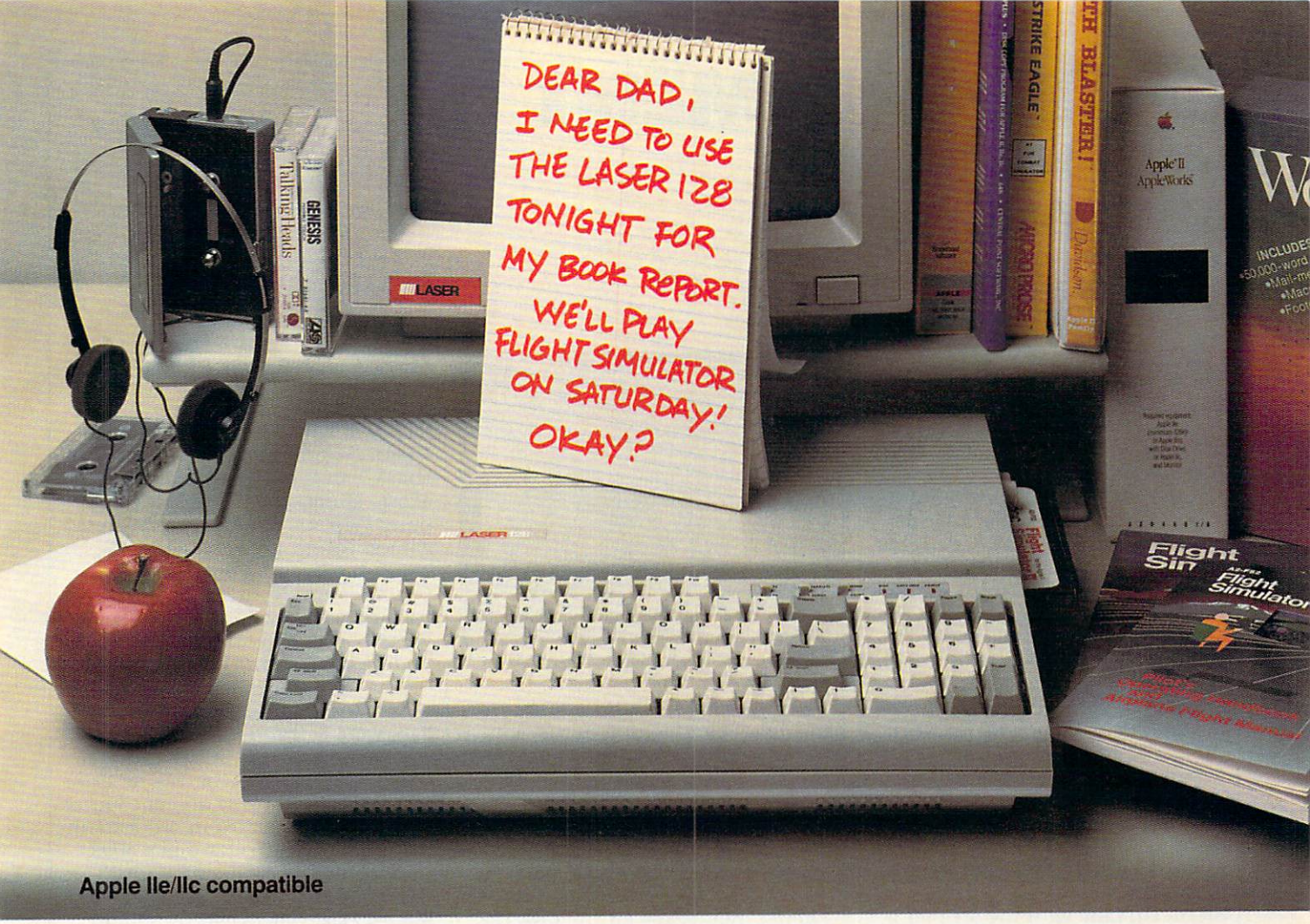
Marie Dolan, a part-time adult-education teacher, wants to reenter the job market full-time and figures she'll have a much better chance getting her foot in the door if she knows word processing. She found that spending a few hours a week learning *Wordstar 2000* (MicroPro) at the Laurel Computer Connection was the best way to start.

FOR FUN AND LEARNING

About half of the software at the Computer Connection is in the home/educational/games category. Many of these programs are ones we don't have at home. My 7-year-old, Courtney, is a big fan of the library's *Stickybear ABC* and *Stickybear Numbers* (Weekly Reader Family Software) and *Facemaker* (Spinnaker). She has learned to spell many new words and to understand the concept of subtraction better by using these favorites.

Aaron, my 12-year-old son, loves to go to the library to use *The Print Shop* to make banners and greeting cards. As he creates, he also learns about computers and peripherals and how to compose meaningful messages. Aaron likes to try out other packages, too. He's learning to type with *MasterType* (Scarborough Systems) and *Typing Tutor II* (Simon and Schuster). One Saturday, he was playing with Davidson & Associates's *Math Blaster* and kept saying, "I like this, I *like* this!" I don't think it occurred to him that, while he was having such a good time, he was improving his ability to convert decimals to percents and vice versa. It was similar to that old LIFE cereal commercial with Mikey eating the cereal "that's supposed to be good for you."

The next time you take a trip to your local library to borrow a book or do research, check out its computer facilities, too. You may find that learning at the library is even more productive with computers. ■



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The Laser 128 with all its features: built-in disk drive; 128K RAM (expandable to 1 megabyte); serial, parallel, modem and mouse interfaces; 80 column text mode; numeric keypad; and an expansion slot; makes for a pretty educated buy. When you do your homework on which computer to buy, you'll find the Laser 128 at the head of the class with value. For more information on the Laser 128 and the name of your nearest dealer, contact Video Technology Computers, Inc., 400 Anthony Trail, Northbrook, IL 60062, or call (312) 272-6760.

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ENTERTAINMENT

HINTS, NEWS, AND NEW GAME FORMATS

WHAT'S NEW, AND WHAT'S RUMORED?

★ **Sierra On-Line**'s new police adventure, *Police Quest—Search for the Death Angel*, is fashioned after the experiences of **Jim Walls**, a former California Highway Patrol detective. Officer Walls—who designed the game—was stationed in the small town of Grapevine, right along the section of Highway 5 dubbed "The Grapevine" (a lone stretch through the sleepy Mojave Desert where just about everyone's car inevitably overheats). There, among many other things, he broke up a local drug-trafficking ring. It was also there that a gunman plugged Walls four times in the stomach, forcing him into retirement. (Incidentally, the gunman went to jail.) After some prompting from his wife, Walls approached Sierra On-Line with the idea for a game based on his drug busts in Grapevine. The company loved his idea. It seemed like a happy ending for Walls. But wait, it didn't end there. The gunman escaped from

***Police Quest* (Sierra On-Line) is based on the drug busts of a California police officer.**

jail, and the veteran policeman and his family had to go underground while he designed *Police Quest—Search for the Death Angel*. The bad guy was renabbed, and Walls resurfaced to finish work on *Police Quest*. The game costs $50 and is available for the **Atari ST** and **IBM PC/PCjr**.

★ Friends in aviation circles tell us that the conjectured existence of a radar-elusive jet called a stealth

Pilot a radar-elusive jet in *Project: Stealth Fighter* (MicroProse).

fighter is kept hush-hush. Governments—including that of the United States—don't talk about these planes; they don't even admit they exist. Nevertheless, **MicroProse** president **'Wild Bill' Stealey**, a former jet-fighter pilot, and simulation designers **Jim Synoski** and **Arnold Hendrick** went ahead with *Project: Stealth Fighter*, now ready for the **C 64/128** for $40. Climb into a cockpit that's equipped with a radar scope, 3-D window, and 30 separate controls. As top gun, you move at mach speed from a tactical strike on the European continent to an air-to-air dogfight over North Africa. . . . **C 64/128** owners who like fast arcade-style action might find that *Airborne Ranger* strikes their fancy. Your joystick controls a soldier who parachutes into enemy territory and embarks on solo infiltration and commando combat missions.

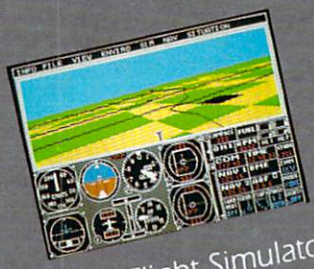
★ Good news for football lovers who own an **Amiga** or an **Atari ST**. An enhanced version of *Gridiron!* has been released. *Gridiron 1.2*, distributed by **Electronic Arts**, is filled with new features such as full touchdown sequences, beginning and ending screens, five levels, and an improved playbook. It costs $60 for the **Amiga** and $50 for the **Atari ST**. . . . Here's an update on the new management of the latest baseball game for the **Amiga**. *Earl Weaver Baseball*, from **Electronic Arts**, allows you to have players *bunt* and *steal* bases, two things Weaver's team rarely attempted in his lengthy career.

★ Video arcade game addicts who've been entertaining ideas of turning their computer stations into arcade halls will have a field day now. **Mindscape** and **Atari Games Corp.** shook hands on an agreement that allows Mindscape to publish computer versions of Atari coin-operated games. Ready, arcade fanatics—here's the lineup: *Paperboy* and *Gauntlet* are the first to make the transition; within a year or so, you should be able to find *Road Runner*, *Road Blasters*, *Gauntlet II*, and *720*.

★ Looking for an exotic adventure? **Polarware Software** can transport you back in time to ancient Persia. Explore lush forests, barren deserts, and abandoned ruins and encounter magicians and genies in order to unearth the mystical charmlike object in *Talisman—Challenging the Sands of Time*. **Apple**, **C 64/128**, and **IBM PC/PCjr** owners can travel now for $18–$20. With those round-trip prices, why wait? . . . Carrying on the tradition of *Spy's Adventure in North America* and *Spy's Adventure in Europe*—both out for the **Apple**, **C 64/128**, and **IBM PC/PCjr**—*Spy's Adventure in South America* will take you south of the border on your search for Dr. X. This newest addition to the series has been designed for the **Apple** for $18 and **IBM PC/PCjr** for $20. The **C 64/128** version is slated for November. —LISA WU

★ And three new adventures should be ready soon from **Infocom**. Keep your eyes peeled for *Plundered Hearts*, a seventeenth-century journey that sets you on a schooner bound for the West Indies. An innocent journey turns into a dangerous adventure. . . . *Nord and Bert Couldn't Make Head or Tail of It* is Infocom's first collection of short stories. Each of the eight stories involves a different type of wordplay. You really can make a mountain out of a molehill, and you'll need to shake a tower before you can take a shower. . . . **Brian Moriarty**, author of *Wishbringer* and *Trinity*, has been working for a year and a half on a

THE FLIGHT CHOICE!



Atari ST screens shown.
Other computer versions may vary.

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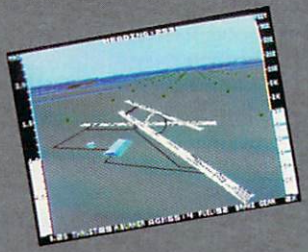

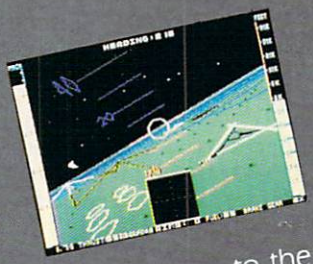

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Atari ST screens

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new project, *Beyond Zork*. Set in the universe of Zork, *Beyond Zork* is a blend of interactive games. . . . Stumped on an Infocom game? If you're really hog-tied, an **InvisiClues Hintbook Kit** may be able to help set you free. Each $8–$10 kit includes a book, a special pen, and a map and gives only enough information to get you going again.

★ **Strategic Simulations, Inc.** and **TSR Inc.** (creators of the classic advanced *Dungeons & Dragons* fantasy role-playing game) shook hands on a five-year licensing agreement that gives SSI the rights to produce and market a product line series of games based on *Dungeons & Dragons*. SSI plans to release at least 10 different role-playing and several action games for the **Amiga**, **Apple**, **Atari ST**, **C 64/128**, and **IBM PC**, all of which you should start to see next summer.

GAME HINTS

THE DESTINY KNIGHT: THE BARD'S TALE II (Electronic Arts). Designer Brian Fargo himself gave us these hints for *The Destiny Knight*. Once again, you have been called upon to right the wrongs committed by evildoers. This time, your task is to gather the seven fragments of the magic Destiny Wand and reforge the parts into the only tool powerful enough to save the realm. (Amiga, Apple, Apple IIGS, Atari ST, and C 64/128)

★ When you create fighters, reroll them until they end up with high dexterity, as it results in a lower armor class. The more dexterous you are, the harder it is to be hit; therefore, an attribute of 18 (for dexterity) means you automatically earn a seven armor class, a 17 equals eight, and a 16 equals nine.

★ Start the game with seven characters, as you'll need that many to stay alive through the starter dungeon in the city. Later, when you leave the city, bring only six characters. Always keep a slot or two open after that and look for clues, because there's one dungeon where you'll be able to use only four characters.

★ When creating your original party, give yourself two conjurers and one magician. Conjurers cast arc fire, while magicians cast quick fixes. You'll need these spells a great deal in the beginning. Balance your original party with a thief, a bard, and a paladin. And keep your paladin in the front rank. These three are lucky and improve your chances if you want to escape combat.

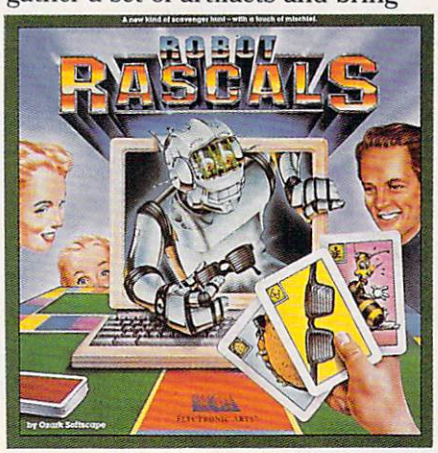
★ At the onset of combat, have your bard sing the song that lowers the armor class for the entire party or the song that allows the group to hit more often.

★ When you're fighting characters who are 20 feet away, fight them hand-to-hand because they might advance. Then you'll get the chance to hit a few of them. It's like getting free hits.

★ Expert hint: If you have a chance, let fighters pick up and use throwing weapons, as they'll have a better chance of hitting the enemy with these than with hand weapons. Use boomerangs, Aram's knife, and the Song Axe because they return to you after doing massive damage.

★ Expert hint: Finally, be sure to sell all your magic items when they have only single charges left. You'll get the same amount as if you sold them fully charged. Then you can buy them back, and they'll be fully recharged again! —JAMES DELSON

ROBOT RASCALS (Electronic Arts). Those of us who would rather quest than fight will find the perfect entertainment in this computerized treasure-hunt game. Using one of a variety of robots (hint one)—each of which has faults for which you must compensate as you play—you must gather a set of artifacts and bring them to a "home base" in order to win. (Apple and C 64/128)



★ Choose your robot well. Each robot has specific strengths and weaknesses. It will take some time to "test-drive" each one to find the one best-suited to your style of play, but it's worth the effort.

★ Use cards wisely. While it may be fun to dump your trash on your friends, don't forget that this act can go both ways. If everybody knows you're out to get them, they'll find ways to stop you. Our favorite method is to be "Mr. Nice Guy" and dump the worst luck cards back into the discard pile whenever you have the chance. Let the others distract themselves by avenging their vendettas while you play fair and win.

★ Make your moves according to an overall game plan. Depending on what you're looking for, you can plan almost all your moves before you ever start playing. If you're lucky enough to draw one or more of the good items, seek them first. They'll improve your chances of winning. Then map out a "route" from item to item and stick to it unless you're distracted by unforeseen circumstances.

★ Go for the green: The special cards really do make life easier. As mentioned above, the good-item cards are very beneficial to play. We often try to pick up as many as we can carry and use them to acquire the items we really need. As you get the right items, trade the good items for favors with the other players. That way, they're doubly valuable.
— JAMES DELSON

MAJOR MOTION (Michtron). An evil alliance, The Draconian League, is wreaking death, destruction, and mayhem on the highways. You, in The Firm's top-secret spy vehicle, must thwart the League's machinations. Using the multiple high-tech weapons and devices available to you, purge the highways of terrorists in this exciting and addictive arcade game. Beware though: the League has stolen an early prototype of your car. (Atari ST)

★ The Turbo Boost is much more useful than you may think. When driving on the divided road, you can

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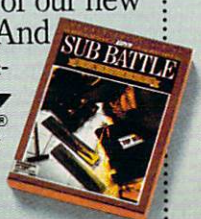

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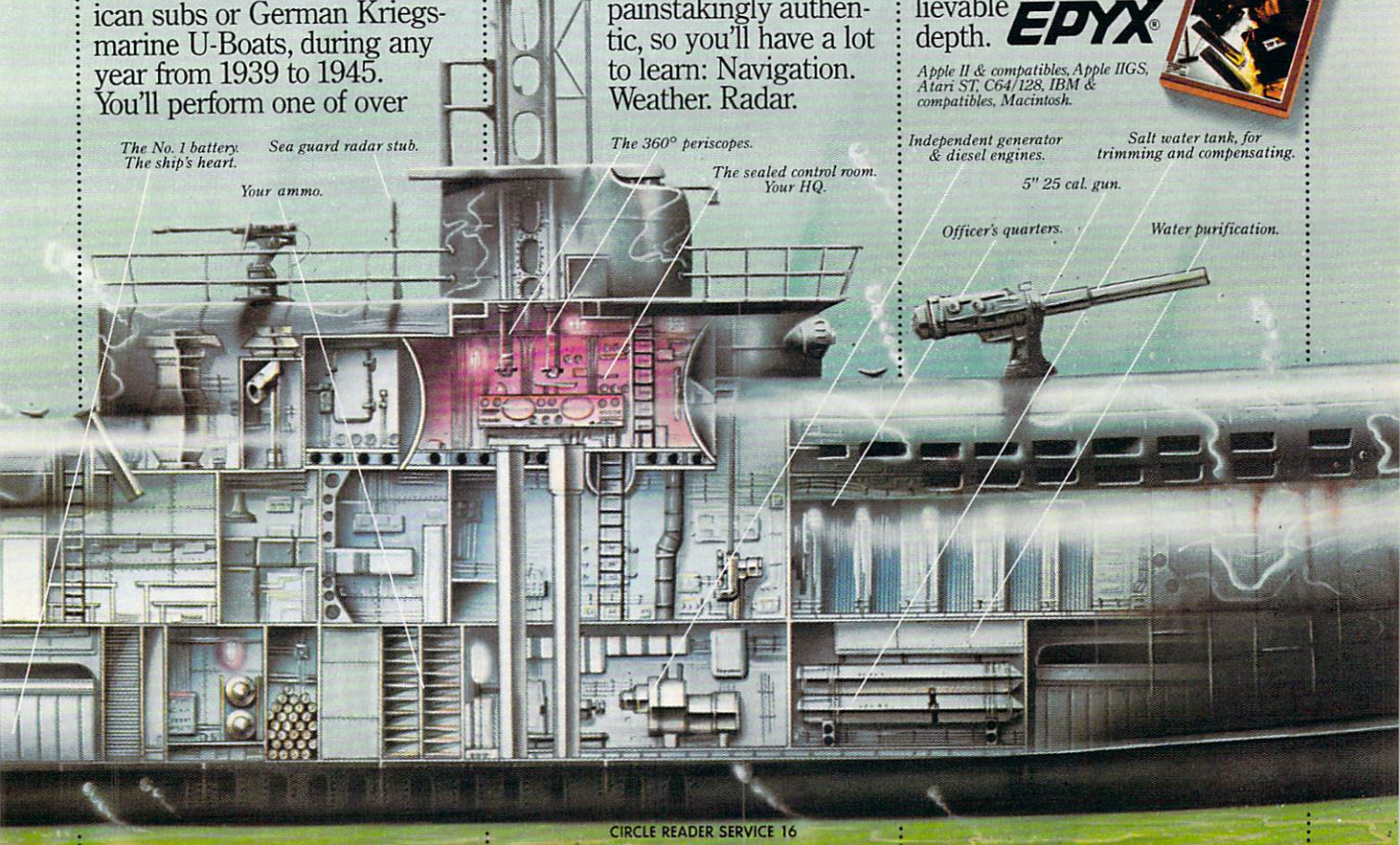

use it to jump over the median or to avoid the water barrier at the washed-out bridge. You can also jump over craters in the road and the mines in the water. The Turbo Boost is also very effective when used with another weapon, such as smoke, oil, or repulsor field. It can even save you if you accidentally destroy too many civilian cars and think the plane is about to attack. Go to maximum speed and hit Turbo Boost when the plane appears and fires.

★ The Evil Twin, despite its formidable name, isn't all that tough. Knock it off the road by steadily pushing it at a slow speed. Just let it come alongside you and force it off the road. Or if the Evil Twin is chasing you and the weapons van is about to pick you up, lure him to the right of the van and let it run him off the road.

★ When the large car that's firing at you comes up behind you, either decelerate to your slowest possible speed as it starts to pass you or—if you want to kill it—position your car so that it rams you from behind. Slowly maneuver over to the side of the road so that the enemy car stays directly behind you. Then quickly move about an inch toward the other side. When the enemy car starts edging next to you, give it a sharp bump on its front corner with your rear corner, and it'll crash.

★ On the water, there's a path on the right side of the screen where no sandbars or islands appear. It's approximately two to three boat widths from the right bank. The exact location can be determined when you go through the first mass of sandbars by making small adjustments until you find the exact point. Once you find it, you can stay there and you'll never crash (although you'd better look out for mines).

★ When you come to sections of the road that are zig-zagged, stay in the center of the screen and you'll hardly have to steer. This is especially useful when you come to icy roads that are zig-zagged. —DAMON OSGOOD *and* DAVID LANGENDOEN

KING'S QUEST III (Sierra On-Line). Voyage to another land and use an evil wizard's secret spells to free yourself. This is the third installment in the *King's Quest* series. *See the August issue for more hints.* (Amiga, Atari ST, IBM PC/PC*jr*, Macintosh)

★ Wizards get hungry after long absences.

★ An asterisk in hand is hazardous to the health.

★ Bears aren't the only ones who like porridge.

★ Giant spiders are no match for magical eagles.

★ Lost? Look behind Mannanan's robes.

★ The wizard can't see whatever's under your bed.

★ Just sit pretty on the way to Daventry.

★ For Abominable Snowmen—if you can't beat 'em, elude 'em. (Just don't show yourself as yourself.)

★ For Medusa, turn around and use the mirror.

★ Don't lose hope when the acorns aren't yet dry. Just return later.

★ And while we're talking about acorns—reached into any holes lately?

★ Flowers retain a lot of moisture.

★ Wait for the eagle feather; it's like manna from heaven.

★ Never surrender when trying to catch animals.

★ A key to success sits atop the closet.

★ Pages are always in Roman numerals. —DONDI DIONISIO
Upland, California

NEW CONVERSIONS

Conflict in Vietnam (MicroProse). Now available for Apple and IBM PC/PC*jr*. Already out for Atari 800/XL/XE and C 64/128. Reviewed in September 1986 issue and *Software Review 1987*.

F-15 Strike Eagle (MicroProse). Now available for Atari ST. Already out for Apple, Atari 800/XL/XE, C 64/128, and IBM PC/PC*jr*. Reviewed in February 1985 issue.

King's Quest (Sierra On-Line). Now available for Apple IIGS and Macintosh. Already out for Amiga, Apple, Atari ST, and IBM PC/PC*jr*. Reviewed in January 1985 issue.

King's Quest II (Sierra On-Line). Now available for Apple IIGS and Macintosh. Already out for Amiga, Apple, Atari ST, and IBM PC/PC*jr*. Reviewed in February 1986 issue and *Software Review 1987*.

King's Quest III (Sierra On-Line). Now available for Apple and Apple IIGS. Already out for Amiga, Atari ST, IBM PC/PC*jr*, and Macintosh. Reviewed in August 1987 issue.

Silent Service (MicroProse). Now available for Apple IIGS. Already out for Amiga, Apple, Atari 800/XL/XE, Atari ST, C 64/128, and IBM PC/PC*jr*. Reviewed in November 1986 issue and *Software Review 1987*.

Space Quest (Sierra On-Line). Now available for Apple, Apple IIGS, and Macintosh. Already out for Amiga, Atari ST, and IBM PC/PC*jr*. Reviewed in August 1987 issue.

Strategic Conquest (PBI Software). Now available for Apple and Atari ST. Already out for Macintosh. Reviewed in July 1986 issue. ■

EDITOR'S NOTE: *Titles listed for the IBM PC/PC*jr *will also run on many IBM compatibles. Owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.*

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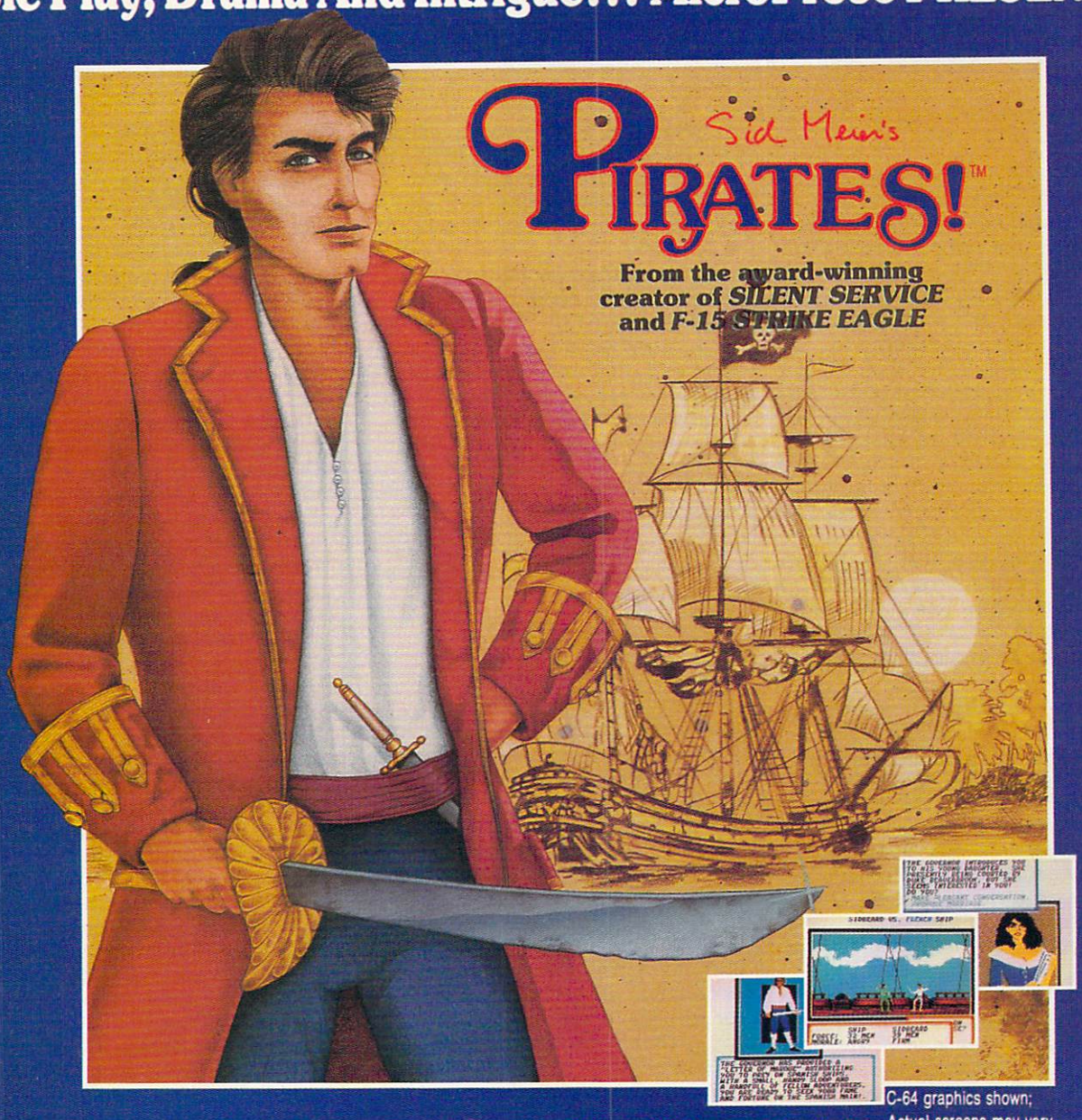

C-64 graphics shown; Actual screens may vary.

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CIRCLE READER SERVICE 23

MACHINE SPECIFICS

NEWS, OPINIONS, QUOTES, AND RUMORS ABOUT YOUR FAVORITE COMPUTER

APPLE

BY CHARLES H. GAJEWAY

Not too long ago, I gave *Dark Castle* from Silicon Beach Software ([619] 695-6956) a rave review as one of the best game programs ever. The same company has another fantastic product in *World Builder*.

World Builder (Macintosh 512K, $80) is a construction set for building interactive software such as adventure games and training programs. It provides you with all the tools necessary to create a stand-alone program completely independent of the construction software itself—with graphics, text, sound, and story line. The construction process is simple and modular, with complete flexibility to create or modify any part of the program as you build.

Naturally, *World Builder* can accept graphics from a digitizer or paint-and-draw program, text from a word processor, and digitized sound from a *World Builder Sound Library* or other source.

Family Entertainment. Aside from the fact that *World Builder* can produce nifty adventure games—it was the tool used to create Silicon Beach's popular *Enchanted Scepters* adventure, and I've downloaded several entertaining *World Builder* games from GEnie and CompuServe—it's probably one of the most friendly and enjoyable ways to teach and learn programming that I've come across.

Creating a story requires logic, which must be expressed in the Scene Map. Adding the hidden clues, character enhancement, and random events that are typical of adventure games require the same kind of logic and control used in business or scientific programs.

Children of all ages will take delight in helping with a *World Builder* project. Because it is totally modular, the whole family can pitch in, with each member contributing a special skill.

Educational Tool. A while ago I put a Laser 128 in my 10-year-old daughter's room as a long-term experiment in dedicating a computer to educational purposes. The Laser 128 (*see New Hardware in August*) is an Apple IIe/IIc compatible; with built-in parallel and serial ports, it sells for only $480.

The results so far have been quite promising. My daughter uses the machine frequently, writing on her own initiative and doing math drills. Her computer skills have sharpened noticeably and become much more sophisticated. I have long felt that a dedicated computer is an excellent educational investment, and the Laser is performing admirably in this application.

CHARLES H. GAJEWAY *can be reached on CompuServe* (ID: 73357,3577) *or on GEnie* (ID: C GAJEWAY).

ATARI

BY JOHN J. ANDERSON

It's "they're-finally-shipping" time at Atari, and we have announcements that should delight both 8-bit and 16-bit Atari owners.

The Atari XEP 80 ($80)—otherwise known as the 80-column box for the XE computers—is on its way to the stores. This unit looks much like a modem and provides 80-columns-by-24-rows of text. If you have a monochrome monitor, the display is superlative. If you have a color monitor, the 80-column text is readable, but probably not too comfortable for extended use.

The unit connects through a joystick port and also serves as a parallel port for your machine. It comes with a utilities disk that includes demonstration programs.

***Steelyboink:* a feast for the eyes.**

AtariWriter 80. And what about software that runs in Atari 80-column mode? Major software developers who support the Atari 8-bit computers all have been sent prototypes, and we may assume they are readying 80-column versions of many existing products. Atari itself plans on selling *AtariWriter 80*, but its release date is uncertain. It makes sense to see this software before buying the 80-column box.

Graphic Frontiers. ST fans will be glad to know that the Stereotek 3-D Glasses (Antic Software; [415] 957-0886; $150) have also finally shipped after a delay of about two months. Let me tell you, it was worth the wait. The package includes four demonstration programs. In addition, *Steelyboink* works with these glasses and is one of the most amazing animations you'll ever see on a personal computer. The program is available through Antic's Public Domain Library for $10. Devised by graphics wiz Tom Hudson of *Degas* fame, *Steelyboink* displays six crystal balls bouncing inside a room, each wall of which sports unique and colorful animated graphics. As the balls move to and fro, they pick up reflections accurately. It's the most profound three-dimensional illusion I've ever seen. This is the Atari ST at its best—crossing the most mind-bending graphics frontier yet.

New 3-D Technology. You may have used those cardboard anaglyphic (red-blue) glasses used with 3-D books and comics or perhaps been to a 3-D movie where polarized lenses were used. The worst problem with both these methods is "cross talk," wherein the image destined for each individual eye "leaks" a bit, creating a ghost image in the other eye. With the red-blue approach, color is nearly impossible as well.

But the Stereotek glasses use a brand new liquid-crystal shutter (LCS) technology, where each lens is actually able to go from transparent to opaque and back to transparent again very quickly. Synched to the Atari monochrome or color display, left-eye and right-eye images can be interlaced at up to 70 times per sec-

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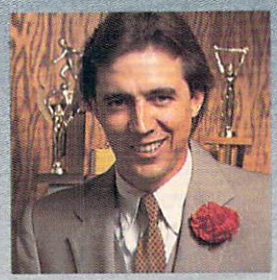
The Coach.



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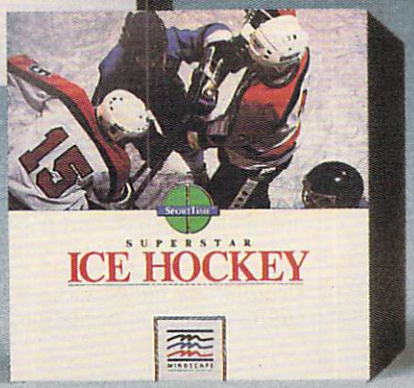

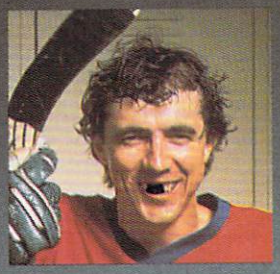

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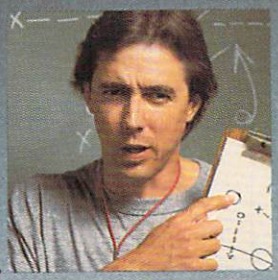

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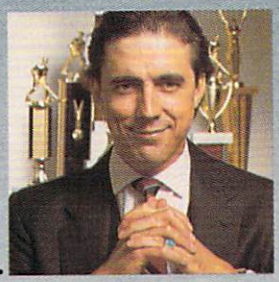

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ond, creating a three-dimensional effect that may compel you to tap on the monitor's front.

Antic's Stereo CAD-3D 2.0. Make your own 3-D pictures and animations with *Stereo CAD-3D 2.0* ($90). Alternatively you can use *Degas Elite* along with a desk accessory that comes with the Stereotek package. Antic Software also has just released an LCS version of *Wander*, called *LCS Wanderer* ($40), its first 3-D game. This arcade adventure puts you in the cockpit of a fighter plane.

JOHN J. ANDERSON *can be reached on CompuServe* (ID: 76703,654).

COMMODORE

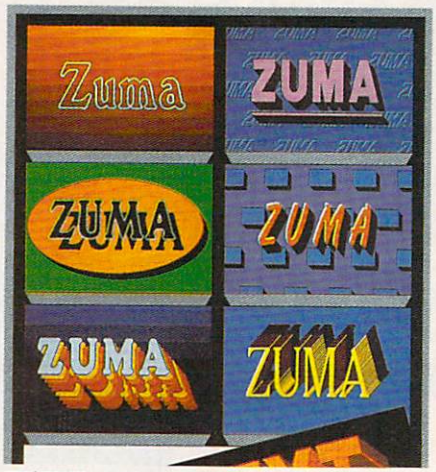
BY SHAY ADDAMS

Commodore's new management team is in place, and its first strategic move last summer was to skip the Consumer Electronics Show in Chicago and exhibit at Comdex in Atlanta, traditionally a more business-oriented trade show. The Commodore booth was virtually all Amiga products (a small section was devoted to the PC 10-1 and 10-2, IBM compatibles), and it was packed.

There were two reasons for the splash. First, *WordPerfect*, one of the top-selling word processors, has been released in an Amiga format (WordPerfect Corp.; [801] 225-5000; $395). *WordPerfect* is the first "big-name" applications software that has migrated to the Amiga. On the Amiga 2000, with the Bridge Board installed, you can even run the IBM version of *WordPerfect* in one window and the Amiga version in another—if you feel like showing off.

Second, Commodore announced that it had "shipped" the new Amiga 500 ($699 without monitor). The verb *ship* in the computer industry means different things to different people, but you should begin to see the one-piece, one-disk-drive, 512K Amiga in stores soon. Commodore and its third-party developers all hope the 500 is the "next Commodore 64," but the price will have to drop before that dream is realized.

New Amiga Software. These Amiga developers, by the way, have some hot software. *TV*TEXT* lets you create presentation graphics for live video productions (Brown-Wagh Publishing; [800] 451-0900; $100). *Professional Page*, a desktop-publishing program, lets you create color



***TV*TEXT*: ready for prime time?**

plates, so that a printer can produce four-color art (Gold Disk Inc; [416] 828-0913; $395). And *Earl Weaver Baseball* takes sports simulations to a new level of complexity and reality (Electronic Arts; [415] 571-7171; $50).

SHAY ADDAMS, *editor and publisher of* Questbusters, *an adventure-game newsletter, can be reached on CompuServe* (ID: 72267,601) *or on QuantumLink* (ID: JBCHALMER).

IBM

BY HENRY BEECHHOLD

Now that IBM has launched its M*A*S*H-ing media blitz for the Personal System/2, what can we expect to follow? After hardware comes software. And since PS/2 makes wild claims about its capabilities, it will have to offer the prospective buyer more than warmed-over PC programs.

Although I don't have a mole inside the company, my magic crystal tells me that high on IBM's software priority list must be a "user interface" that will unify a full spectrum of programs in the Macintosh manner. Uniformity is the key, and it'll undoubtedly be closely bound to Microsoft's Operating System/2 (OS/2), the forthcoming operating system for the PS/2 models 50, 60, and 80.

IBM's SolutionPac Personal Publishing System—the Model 30, a laser printer, and Aldus's *PageMaker* and Microsoft's *Windows*—seems to tell us exactly which way the IBM software wind is blowing: windows, mice, graphics.

Ideally, every program added to IBM's software collection will match as closely as possible every other, with respect to screen appearance, menu system, and special key assignments. Since IBM has developed a coherent family of computers, it would seem incomprehensible for the company not to foster a coherent family of programs!

Speaking of Coherence . . . Have you looked longingly from time to time at integrated software but couldn't find it in your heart or wallet to spend the hundreds of dollars most of these programs cost? Take out your checkbook, you're about to take the plunge. And for your $39.95 plus $5 for shipping (that's no misprint!), you'll get a speadsheet, mail merge, database manager, directory and file manager, forms and reports generator, word processor, and line graphics generator—all tightly integrated within a single operating environment. Hold on! How can you receive all of this for $39.95 and expect anything but a toy?

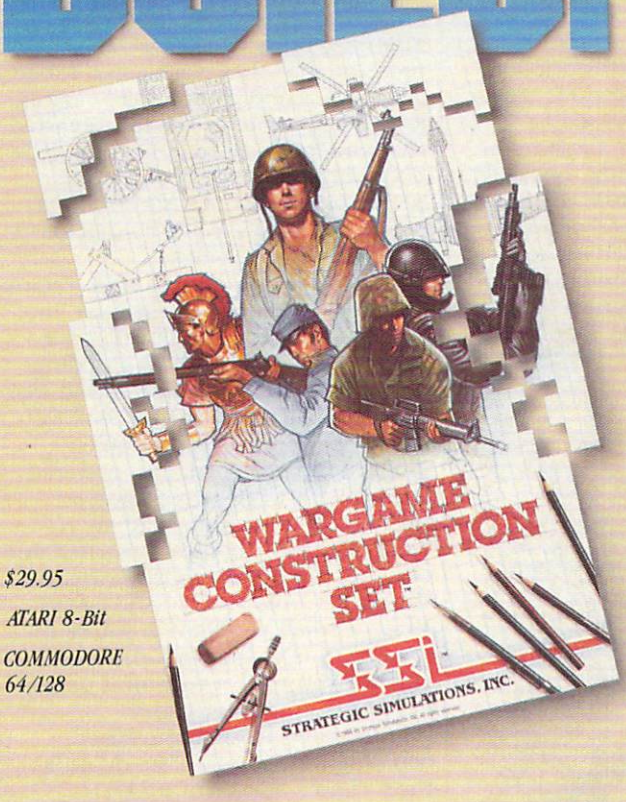
The answer is *Intuit IS-2000*, a program that can serve many small businesses as their main piece of software. Here are just a few of *IS-2000*'s features: file names up to 67 characters long in directories of up to 4,000 entries; text formatting with custom-designed format scripts; data sortable on any two fields and locatable for up to 10 criteria; up to 65 database fields per record; spreadsheets as large as 200 columns by 65 rows and an on-line desk calculator.

The integration is far greater than that of most well-known multifunction productivity programs. But because one person's intuition may not be another's, be prepared to crack your head on this program—for a little while anyway. Once you've developed the intuition the program expects of you, things will go along easily enough. In most cases, one or two keystrokes will move you from any point to any other point. And the command structure for, say, the database or spreadsheet exactly matches that of the word processor.

Intuit IS-2000 can be ordered directly from the developer: Noumenon Corporation, 512 Westline Drive, Alameda, CA 94501 ([415] 521-2145). (*Noumenon* is a Greek word that means "something conceivable that's not perceivable," according to the manufacturer.)

HENRY BEECHHOLD *is the author of* The Brady Guide to Microcomputer Troubleshooting & Maintenance *(Brady Books, Prentice Hall Press, New York).*

BUILD.



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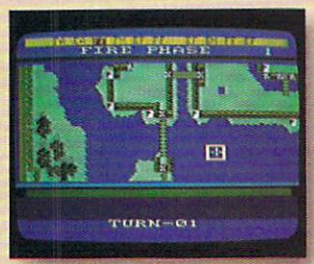

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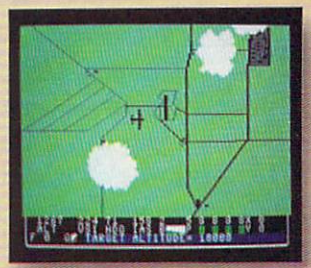

Once you're in the air, your first goal is to form up with your bomber group and race to the fighter rendezvous points. Your escort fighters can only stay up for a limited time, so don't be late.

If you get hit, you'll have to decide whether to bail out or stick it out and do your job — reducing Ploesti's total oil production below what was accomplished historically. If you succeed, you'll be told how much you would have shortened the war in Europe!

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CIRCLE READER SERVICE 37

MACHINE SPECIFICS

MS-DOS

BY STEVE MORGENSTERN

For my everyday work at the computer, my Leading Edge Model D, running at 4.77 MHz (purchased before the company changed to a two-speed model), has been perfectly adequate. However, as I mentioned last month, I recently started a desktop-publishing venture, and that sent me into the complex and confusing world of accelerator boards.

Did I absolutely need one? No. Several popular MS-DOS desktop publishing programs, including *Ventura Publisher* (Xerox; $895), *Harvard Professional Publisher* (Software Publishing Corp.; $695), and *PFS: First Publisher* (Software Publishing Corp.; $149) work adequately with a slow-speed PC, XT, or compatible. However, based on design considerations for the kind of newsletter I'm publishing, I wanted to use *PageMaker* (Aldus; $695), and it requires the speed of an AT.

Breakthru 286. I selected an accelerator board called the Breakthru 286-12 from Personal Computer Support Group ([214] 351-0564). Does it work as promised in the company's ads? Absolutely. Did I make the right choice? Maybe. Here's why:

The Breakthru 286 ($595 for 12MHz version; $395 for 8MHz) is a half-slot card that works on a range of IBM PCs and compatibles. Installing it isn't a job for the fainthearted, though. You have to pull a chip (the 8088 microprocessor) out of its socket on your computer's motherboard and plug a cable connector into that empty socket.

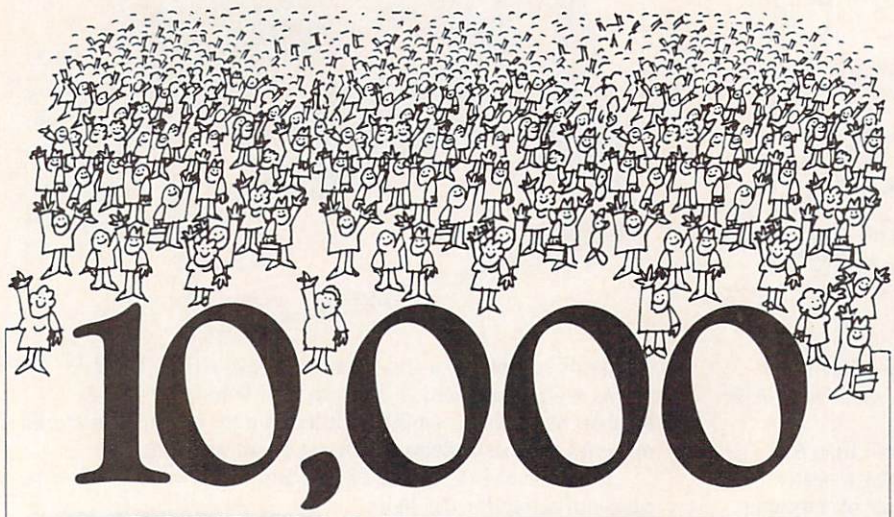
I have changed boards in my computer several times in the past, but I'd never monkeyed around at the chip level before. Oh well—holding my breath and the chip removal tool supplied with the board, I took out the 8088, connected the cable, plugged in the board, and powered up. A blank white screen and a healthy dose of panic were my reward. Happily, though, it turned out that the board was poorly seated in the socket. Another try and everything worked perfectly. If you're reluctant to take the risk, though, I'd suggest you have a technical person install the board for you.

I now have an absolute speed demon on my hands. The manufacturer claims speeds of up to 10 times faster than an unenhanced 4.77MHz model using the accelerator board. While I haven't scientifically clocked it, the hands-on difference is certainly impressive. My usual word processor, *XyWrite III*, is known for its speed under normal circumstances. Now it accomplishes any task in the blink of an eye, and similar dramatic changes are evident with spreadsheets and especially database programs.

The acid test was *Microsoft Windows*, a notoriously pokey Macintosh-like operating environment, and the environment that the MS-DOS version of *PageMaker* employs. No problem. The tasks that would take much too long at ordinary speeds, such as reformatting text and redrawing the screen after making changes to a page, are accomplished with only minor hesitations.

Slow Hard Disk. So now I have plenty of speed without spending the extra bucks for an AT—but there's still a problem. My hard-disk drive is no match for those typically installed in an AT, and *PageMaker* frequently accesses the hard disk.

While the program executes commands with all the speed I need once it has all the information it requires, waiting for it to read the hard disk



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STEVE MORGENSTERN *can be reached on CompuServe* (ID: 72545,606).

TANDY

BY STEPHEN MILLER

While I've been looking in other directions, the Tandy portables (models 102 and 200) have been undergoing unbelievable changes, not the least of which is that the 102 is even lighter than the old lightweight 100. Many of the changes have come from third-party vendors. Two of the leading vendors are Traveling Software ([206] 483-8088) and The Personal Computer Support Group ([214] 351-0564). If you have a Tandy laptop or are thinking of buying one, you should get the catalogs from these two companies.

Sardine. One product I tested was Traveling Software's spelling checker, *Sardine* ($100 in 3.5-inch disk version; $170–$200 in the plug-in ROM/disk versions). *Sardine*'s ROM version also includes the *T-Word* word processor. The ROM chip is inserted in the slot underneath the computer. The chip contains *T-Word* plus *Sardine* and part of the dictionary that checks spelling. The rest of the 30,000-word dictionary is contained on a 3.5-inch floppy disk that comes with the program. For hard copy fans, Traveling Software also includes a pocket version of the *Random House American Dictionary* on which the spell checker is based. The $200 version offers this dictionary in ROM.

T-Word. I like *Sardine's* spell checker but I was more impressed with *T-Word*. One complaint most Tandy portable users have is that the document formatting and printing capability of *TEXT* (the built-in text processor) is clumsy at best. *T-Word* offers a menu of every option you need in formatting a document—setting margins, line spacing, page length, justification, and even the number of copies to be printed. One feature useful for determining page breaks is PLOT, which provides a graphic representation of how the document will look when it's printed out.

A Word About *Word*. Those who use Microsoft *Word* might have noticed that because of the nonstandard key arrangement of the EX and SX, certain keys apparently don't work. This includes the backslash key (\), a vital key if you have a hard-disk drive with subdirectories. Normally, you can't change to a new subdirectory while in Microsoft *Word* because you can't type a backslash. But there's a way to fix it.

In your CONFIG.SYS file add this: DEVICE=KEYCNVRT.SYS.

If you don't already have a CONFIG.SYS file, here's a simple way to add one. With A> on the screen (or C> if you have a hard-disk drive), type this: COPY CON CONFIG.SYS [ENTER]. Add the DEVICE line, and press the F6 key and CONTROL-Z will appear. When you press the RETURN key again, the computer will respond: 1 FILE(S) COPIED, and you will be able to use the backslash key.

STEPHEN MILLER *is a computer consultant and journalist.*

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ORPHANS

BY PATRICK SPERA

I cannot believe it's October already. Sigh, time to unlimber the old jack-o'-lantern simulator program. The visiting kids get a kick out of it—those who aren't scared by it.

Heath Support. Back in the good ol' days, Heathkit made several versions of a Z-80 kit computer. Yep, you had to build it. Well, it's true that Zenith later sold completed versions of the Heathkit computers, but several thousand H-88 and H-89 kits were actually assembled by users.

For many years, Sextant (716 E. Street, S.E., Washington, D.C. 20003; [202] 544-0900; six bimonthly issues, $14.97) has provided coverage and support for these machines. It still does an excellent job, too! But with the Heath/Zenith switch to IBM-compatible computers, more and more coverage is being given to the new machines.

So, where would a die-hard H-8 hacker go for strictly 8-bit computer talk? Well, you might want to get a copy of the *Society of Eight Bit Heath Computerists Journal*. The *SEBHC Journal* is a 20-page newsletter packed with tips, reviews, short stories, and news with an 8-bit slant. OK, so they'll talk about the Z-100, but only in the 8-bit mode! For more information, write to Leonard Geisler, 895 Starwick Drive, Ann Arbor, Michigan 48105 ([313] 662-0750; 12 issues for $15).

Rave Keyboards. Timex-Sinclair users have been using TI-99/4A surplus keyboards to upgrade their computers for years now. But, if TI users became tired of their keyboards, what could *they* do? Enter Rave 99 and its keyboard addition for the 99/4A (112 Rambling Rd., Vernon, CT 06066; [203] 875-9833). For $200 plus $10 for shipping, you get a full-size keyboard, cable for the keyboard, and interface unit. With the new keyboard you will have access to symbols such as the question mark, quotation marks, and slash (?, ", and /) without having to use the FCTN key. Hurrah! Be warned, though, you have to open the computer's case and remove the old keyboard.

PATRICK SPERA *is sysop of the Computer Club Forum on CompuServe* (GO CLUB), *a meeting place for owners of orphaned computers.*

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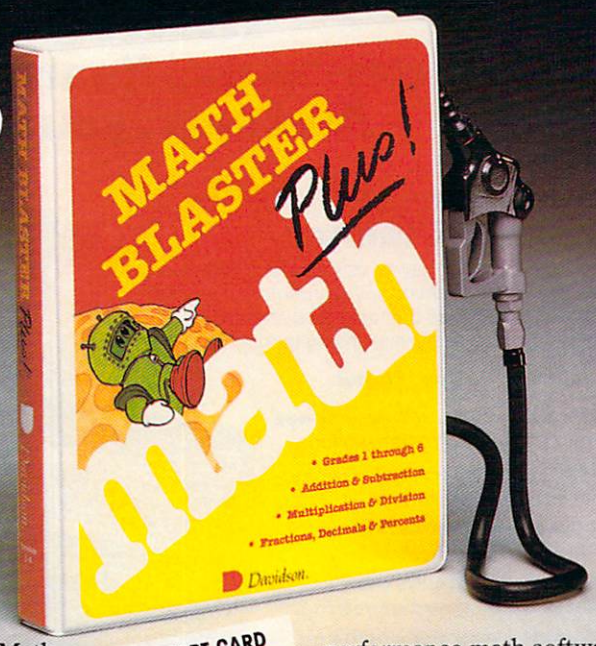

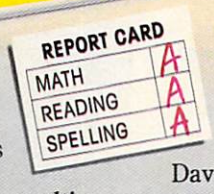

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CIRCLE READER SERVICE 43

FAMILY & HOME OFFICE COMPUTING

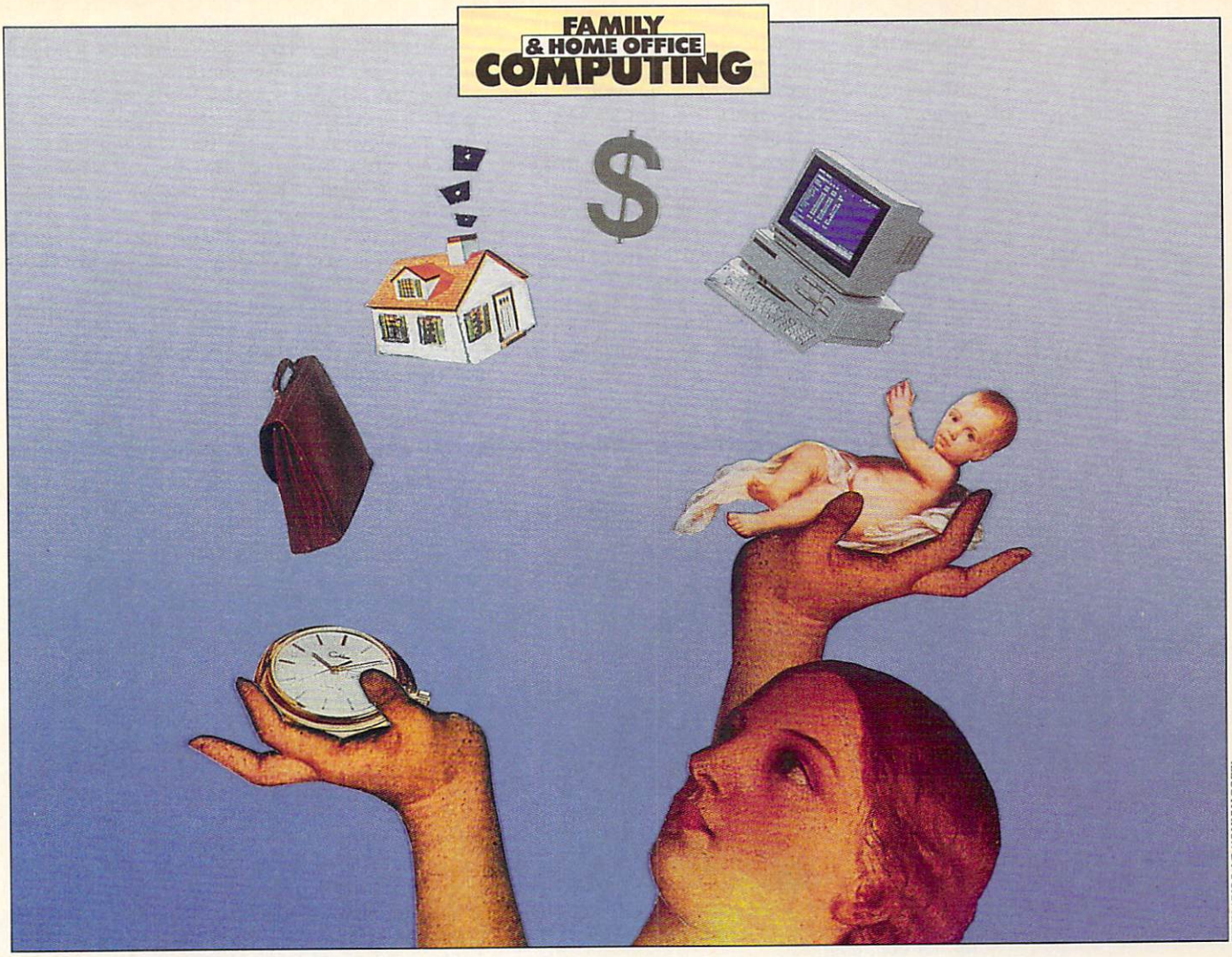


ILLUSTRATION BY JOAN HALL

Women Who Juggle It All

FOUR MOTHERS TELL HOW THEIR COMPUTER-EQUIPPED HOME BUSINESSES HAVE MADE IT POSSIBLE TO 'HAVE IT ALL'

BY BARBARA STEIN

Family. Home. Career. Certainly, the juggling act of the 1980s for women with children and careers. Still, despite the complexities of modern life, we're working out the bugs—reevaluating the trade-offs and creating new ways to achieve a comfortable blend.

Some mothers have put their careers on hold, trading job titles for "Mom" while the children are young. Others have sliced career commitments in half. Still others—like the four mothers profiled here—have discovered that it's possible to satisfy career and family needs by packing up the office and bringing it home.

Not that running a business from home and simultaneously raising kids is a new concept. On the contrary, mothers have juggled both for decades, but not such large numbers of women with high-earning potentials. And certainly not in such diverse areas of business.

Thanks to the computer, opportunities never before available are ripe for the picking. Today's working mother can now protect and maintain her career—or even develop a new

BARBARA STEIN *wrote "Success At Home," our July cover story. Barbara, who has 15-year-old twin daughters, left her career as a speech pathologist five years ago and started up a home-based word-processing/writing business.*

one—without sacrificing home and family. The work-at-home lifestyle offers maximum flexibility in scheduling work as well as planning leisure hours with the family. Not surprisingly, most mothers who work at home full-time or part-time would move mountains to stay there.

They're home when their children arrive after school, free to take a break to visit, and able to return to the keyboard later. The same applies to the early-morning rush. There is no commute, and it takes less time to primp for the office; suddenly there's time to make sure the kids eat a good breakfast and make it to the bus stop.

And the dollar savings for mothers who opt to work at home are nothing to sneeze at either. In a study of homeworkers, business consultant Joanne Pratt found that home-office employees working for corporations reported an estimated savings of $200 per month on food, $100 per month on clothes, and more than $100 per month on gas, parking fees, and insurance. Beyond that, Uncle Sam allows tax deductions for home offices used exclusively for work.

Here's how four mothers joined the technological revolution and built successful home careers—and how they still have plenty of time for their families.

Rocie Petchprom

Owner, Computerized Accounting Services

"[AS A FULL-TIME AUDITOR] I WAS GONE THREE WEEKS OUT OF EACH MONTH . . . MY HUSBAND HELPED A LOT, AND I HAD A HOUSEKEEPER, BUT IT WAS JUST TOO MUCH STRESS."
—ROCIE PETCHPROM

An M.B.A. gave Rocie Petchprom the credentials she needed to leave the corporate world and set up her own business.

To the casual observer, Rocie (*pronounced Ro-cee*) Petchprom had it all and traded it for less. But looks can be deceiving.

Until two years ago, Petchprom was a financial auditor for a large energy company in Houston. Frequent international travel—all expenses paid—came with the position. But each time she boarded a jet, she waved goodbye to her husband, Chock, and five children—two daughters, ages 7 and 12; 10-year-old twin boys; and an 18-year-old son. Not surprisingly, the pull of home and family cast a shadow over her career.

"I was gone three weeks out of each month, and it was very hectic," said Petchprom. "Traveling put a strain on the family and our relationship. My husband helped a lot, and I had a housekeeper, but it was just too much stress. I called home often at the company's expense, but it wasn't the same. So I left."

Petchprom set up shop at home in suburban Houston. Capitalizing on her M.B.A. and accounting background, she founded Computerized Accounting Services, a consulting firm offering small businesses a variety of financial services—from tax preparation to financial planning.

"With five children, it was difficult to segregate an area of the house [in which] to set up my office," said Petchprom, recalling the transition. "The capital outlay, although substantial, was minimized as we already had an IBM PC and software. It was difficult at first, but I was very excited at the idea of being on my own, and I saw lots of potential."

Armed with Peachtree's *Complete Business Accounting System*, and later, BPI Systems's *General Accounting*, Software Publishing's *pfs: Write*, Lotus *1-2-3*, and an Epson printer, Petchprom set out to assist local business owners with payroll, cost accounting, inventory control, audits, reconciliations, cash management, financial statements, and tax planning. "Many business owners need to know more about financial flow, retained earnings, long-term financial planning, and the options for incorporating," she said. "Since I have the background and experience and my business is fully computerized, I can provide those services with lower fees."

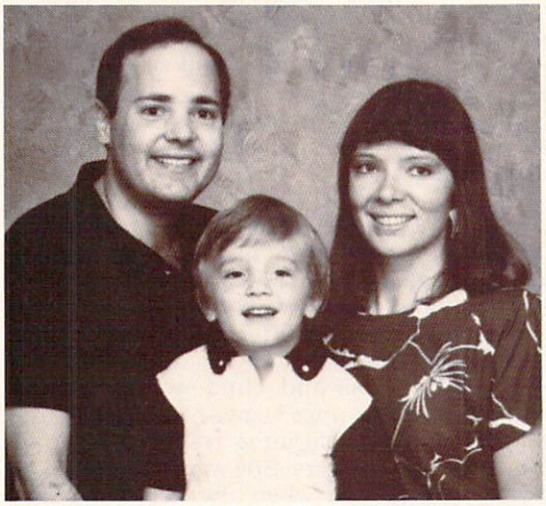
To keep things running smoothly, Petchprom decided it made more sense for her to travel to the clients instead of having them come to her home. This fit her plan to separate family and work. "My clients like the idea that I can adjust my schedule to their time," she said. "I can always meet them after 5:00 p.m. and on Saturdays, if necessary."

On the other hand, Petchprom can also adjust her schedule to meet family needs. She especially likes the fact that she can now attend school events. "I couldn't do that before," she explained. "When I visit the children's classrooms, I can see their faces shining. Even their teachers notice and comment."

Most days Petchprom leaves the keyboard at about 4:00 p.m. "That's when the commotion really starts," she laughed. "I stop when the kids come home and sit with them. They tell me about their exams, and we look at their study sheets. Then they have a snack and start their chores."

Petchprom depends heavily on her husband, a computer scientist, to assist with technical problems and to lend a hand with the family when the going gets rough. "He's very supportive," she said. "He likes the idea that I'm home and caring for the kids. He also likes to cook and is good at it. If I'm running behind, he'll start throwing dinner together."

Charlene Weiss
Director of the Office of Field Coordination and Management, National Opinion Research Center



When Charlene Weiss and her family moved to Arizona, she took her Chicago-based job with her.

Ordinarily, a job transfer wreaks havoc on a two-career family. Either the transferred spouse relocates and commutes home on weekends or the family moves together and the other spouse sacrifices his or her job. But neither option appealed to Charlene Weiss.

Weiss was a supervisor for the National Opinion Research Center (NORC)—a nonprofit social-survey research organization affiliated with the University of Chicago. So when her husband, Dennis, a psychiatrist, was sent to Arizona to fulfill his military obligation, she packed up 2-year-old Jeremy *and* her job and took them with her.

Today, she's the long-distance director of field coordination and management for NORC and responsible for supervising a national field staff of 800 interviewers and 80 field managers. Although company headquarters are in Chicago, Weiss administers everything from home in Fountain Hills, a small community near Phoenix, via modem and telephone.

"We thought the move to Arizona would be temporary, that we'd return to Chicago," Weiss explained. "But we fell in love with Fountain Hills and after three years of mild winters, we didn't want to go back. My boss was hesitant at first," she added, "but since there wasn't anybody readily available to step into my position, she took the chance and it worked out." Today, the arrangement is permanent.

In the beginning, Weiss worked on a computer terminal hooked to the company's mainframe. But now she sends reports, proposals, and memos to her co-workers using her PC compatible, a Hayes modem, *Crosstalk* (Crosstalk Communications), and *WordPerfect* (WordPerfect Corp.). To access the databases for field personnel, she simply dials the company's mainframe.

"MY IN-LAWS DON'T UNDERSTAND WHY I LIKE TO DO THIS. THEY SAY 'YOU'RE SO SMART, YOU COULD GET A BETTER JOB.' "
—CHARLENE WEISS

TEN TIPS TO HELP YOU PUT YOUR HOME OFFICE TO WORK

1. Situate your office away from family traffic. A room in an out-of-the-way place earmarked "my office" is ideal—and a tax write-off. When Charlene and Dennis Weiss built their new home, they had offices constructed on either end. If you lack space, clear a quiet corner where you can work uninterrupted.

2. Explain your work situation to family and friends. Let them in on your plans. Family members who understand your setup and work routine are more likely to support your effort. As for friends, relatives, and neighbors, make it clear that you're "at work," even though you're at home. If people suddenly start calling to see if you're really working or drop by for a chat, don't be afraid to tell them that you can't take time out from your busy workday.

3. Adopt a businesslike attitude. Clients will respect you for it and so will your family. Said Meredith Kunsa: "I'm real focused. When I'm working and my office door is closed, I'm at work. If you truly believe your office is your office, then everybody else will too."

4. Become a time-management expert. Prioritize every day. Flexibility can be its own trap. Arrange your work schedule so it blends with family life. For example, if early-morning or late-afternoon hours are chaotic, adjust your work routine. On the other hand, do your best to keep work commitments from interfering with family life.

5. You can't do it all, so ask for help. Assign chores to the kids and ask your mate to pitch in. Remember why you're home to begin with and don't waste precious work hours doing household tasks. If you're inclined to "straighten up here and there," pretend that you're working in an office downtown. Hire a maid if you can afford one.

6. Install a separate business telephone line and answering machine. Don't try to share your family's telephone with your business. If you do, you aren't being fair to your spouse and kids or to your clients and/or business associates. And since office telephones shouldn't be left unattended, connect an answering machine. Answering machines are also helpful when you're wrapped up in family matters that require your undivided attention.

7. Find a suitable "business-conference room." If you have a full-fledged office or library, it's probably an appropriate place to meet with the majority of your business associates. However, there may be times when a meeting room at a local hotel, restaurant, or club is more suitable. Try to find one within your price range that you can reserve.

8. Don't rule out a child-care service just because you're working from home. Especially if you're a single parent, you may need a babysitter for a few hours a day or week. Those hoping to escape child-care expenses altogether may find themselves pulling double duty; both are full-time jobs. There are many more options now for in-home child-care and co-ops.

9. Find out how other professionals have set up shop at home. You might want to read *The Woman's Work-at-Home Handbook: Income and Independence with a Computer*, by Patricia McConnel, a 352-page resource book that shows how a number of women have used computers to build home-based businesses (Bantam Books, 1986, ISBN 0-553-34324-6).

10. Leave your work at the office and close the door. This is especially difficult because the office is so conveniently located. Still, like all career people, you've earned time away. Take it. At day's end, switch off your computer, close the office door, and relax with the family.

Weiss is the only NORC senior staff person who works at home full-time, but she's convinced that others would benefit by following suit, "even a half day a week," she said. "It's worked out quite well for me. There's so much flexibility. And I don't have to commute! A lot of my phone friends are curious about it and wonder if it's boring or lonely. They wonder how I motivate myself and if I'm distracted by housework."

As most home professionals are quick to point out, there are distractions that are more compelling than a pile of dirty laundry. In Weiss's case, it's a telephone that never stops ringing. Add that to a hefty work load and her responsibilities as a mother, and you can guess where housework ranks.

"My in-laws don't understand why I like to do this," she said. "They say 'You're so smart, you could get a better job.' But I don't want to work 80 hours a week. How can you have a quality family life? I know people do that but, as I'm always explaining to everyone, I can't do everything. I have to make choices."

One choice made early on was to put Jeremy, now 6 years old, in all-day preschool from the time he was 2 years old. "He loves it, so I don't feel bad about it," said Weiss. "Of course, during vacations and when he's sick, he stays home with me—which is nice. He plays quietly in the background with his toys. Sometimes when I'm working and he's home, he asks me why I can't come out to play. But I've worked at home since he was little, so he's used to it."

Weiss's job requires her to travel to Chicago a few days each month. While she's away, Jeremy stays with one of his teachers. "Dennis is the medical director of a new psychiatric hospital and works very long hours," she explained. "It's difficult for him to get Jeremy to and from school."

The Weiss's second child was born last spring; Weiss arranged maternity leave without difficulty by delegating responsibilities to four district managers. She worked right up to her due date, and when the new baby was born, she simply switched off her computer and became a full-time mother for a few months.

Meredith Kunsa

Owner, Speakers' Consortium

PHOTOGRAPH BY DAVID HARPER

Meredith Kunsa chose to set up a home business so she could spend more time with her daughter.

"I HAVE A 26-YEAR-OLD DAUGHTER, AND WE GREW UP TALKING TO EACH OTHER WITH NOTES ON THE REFRIGERATOR. I DIDN'T WANT TO DO THAT AGAIN."
—MEREDITH KUNSA

"Deciding who would stay home when Andee was born was a major decision," said Meredith Kunsa, recalling how she came to leave her position as Director of Operations and Research at the University of California at San Diego's Medical Center. "I have a 26-year-old daughter, and we grew up talking to each other with notes on the refrigerator. But I didn't want to do that again. So I elected to stay home and start up some sort of consulting business. I took half of an annuity and decided it was OK to blow it. I gave myself a year to start something and to see whether or not I could make it."

Today, Andee is 12 years old, and Kunsa's consulting business, Speakers' Consortium, thrives. Kunsa is an agent for a number of management consultants and speakers. She arranges for her clients to give advice and speeches to the corporate market and orchestrates all of the scheduling, paperwork, and promotional work from her San Diego home.

At the moment, a good portion of Kunsa's time is devoted to a university-based entrepreneur and motivational speaker whose expertise in business consulting is much sought after by large corporations, such as Ralston Purina, General Dynamics, and IBM United Kingdom. Having linked her IBM PC to her client's computer via modem, she arranges and rearranges his crowded calendar, coordinates his management programs, and handles all promotional work, database mailings, and correspondence. "It's the old 80-20 rule," said Meredith."Twenty percent of the clients represent 80 percent of the revenue."

Kunsa, who can't imagine working without a computer, purchased her IBM PC five years ago. Using *WordStar* (MicroPro), *dBase II* (Ashton-Tate), a merge-print program, and dot-matrix and letter-quality printers, she easily tracks clients' speaking engagements and maintains files and databases on each individual as well as the companies that have used her services. "I don't have time to waste doing tasks that can be performed more efficiently with a computer," she says.

As one who truly enjoys her work, Kunsa takes care in dividing her time so that work commitments do not overshadow family life. "The biggest problem is keeping my perspective on the number of hours I work and spend with the family, remembering why I'm home to

begin with," she said. "You have to have good communication with the family. There are times when they have to pitch in. My husband, Jan, a health-care administrator at San Diego State University, is my biggest promoter and stands behind me. And he's a very nurturing father," she added. "Until Andee was five, I never gave her a bath. That was his special time with her. He pulls his equal share."

Clearly, Andee also likes the idea that her mother is home and accessible. "She's really proud. Somehow she respects what I'm doing," said Kunsa. "It's not like she's ever taken it as frivolous. Even the neighborhood kids interviewed me for career day. They see it as something special. And it is. It enhances my role as a mother because I'm here in the morning to get Andee off to school without time constraints. And I'm also here when she gets home."

Deborah Kovacs
Freelance Writer and Editor

A chance to raise her daughter, Sarah, in the country prompted Debbie Kovacs to quit her job and leave New York City.

Two years ago, three city mice decided to pack up their belongings and move to the country. So Deborah Kovacs, her husband, Nick Sullivan, a senior editor at FAMILY & HOME-OFFICE COMPUTING, and their newborn daughter, Sarah, bid farewell to New York City and headed for a rural community in South Dartmouth, Massachusetts. Knowing that they would still have to make frequent trips to the city because of Sullivan's job, they sublet their city apartment with the agreement that two rooms be reserved when they're in town.

"We created a win-win situation," said Kovacs. "Our decision was to spend as much time as we could in the country. That meant that one of us had to remain flexible and be available to drop everything to care for the baby. For both of us to have full-time staff jobs was not a realistic goal. So Nick goes to New York every couple of weeks, and I'm the flexible one. I had had it with 60-hour work weeks anyway, and I didn't see how that blended with having young kids. We're expecting another child, and when both kids start school, I'll probably go back. This is sort of an interlude, a floating period. But with the trade-offs, it's working out well."

Kovacs and Sullivan have joined the growing ranks of married couples working together at home—some joining forces to operate a single business, others working in separate endeavors, a good percentage also raising kids. Housed in an old barn that's being restored, they've created a lifestyle that fulfills family as well as career needs.

"We spent the first year shaking it down," Kovacs said of their new lifestyle. "All three of us were traveling to New York every week, and it was very stressful. It's easier now that one person goes back and forth and the other two stay put. When I go to New York, I go alone and get so much more done."

With the travel problems squared away, Kovacs and Sullivan have settled into a comfortable routine. When both are at home, they leave Sarah, now 2 years old, at a child-care center and settle down to work—in their separate offices, using different computers and telephone lines. While too much togetherness spells trouble for some couples, Kovacs clearly enjoys the arrangement. "I'm glad Nick is home when he's here," she said. "It's not a pressure. He's very low-key. And he gives me just the right amount of distraction."

As for her writing career, Kovacs contends that she's always wanted to be a writer, but continually put it off by taking other jobs. Today, she writes text for software, collaborates with other writers, and serves as an editor and writer for magazines.

She spends the majority of her day with an Apple IIe and a Hayes modem. "I rely on MCI Mail," she said. "I use my modem to send manuscripts and reports, MCI prints them out, and a courier delivers them in four hours.

"Freelance writing is suited to working at home and is totally flexible," Kovacs explained. "I like the fact that I can be thinking about work and do it when I want to. I schedule my writing for 20 hours a week while Sarah is in child care from 8:30 a.m. to 1:30 p.m. Then I spend the afternoons with the baby. We take a good walk every day. Of course," she added, "if I have a rush project or if I'm pressed, I get up early and work a longer day. And when Sarah stopped taking naps, I had to reorganize my life. But I'm not so overwhelmed by her needs that I've had to overlook my commitments.

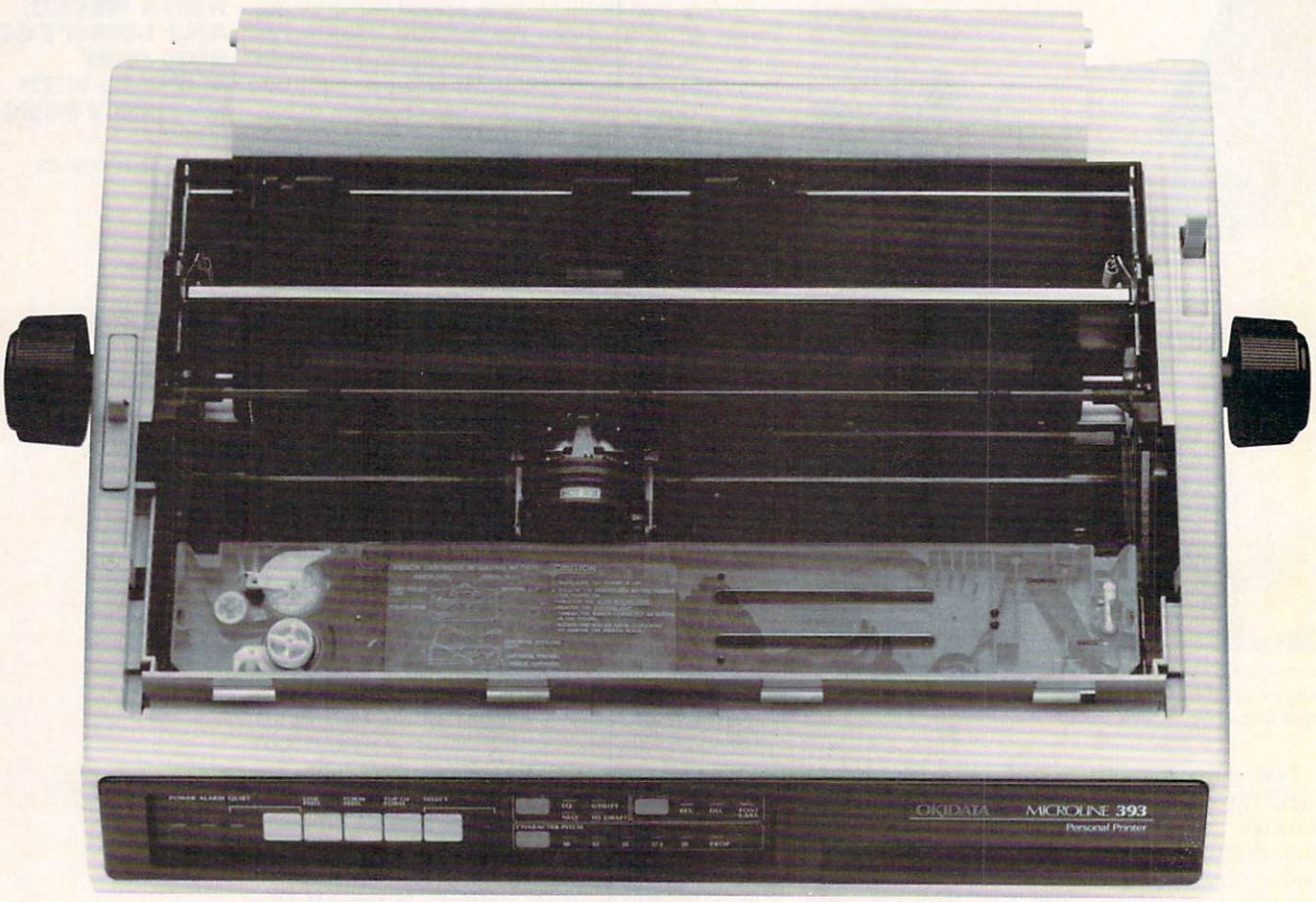
"I couldn't not work," said Kovacs. "I'd go cuckoo. I'm happier this way. And I never feel guilty about my daughter." ■

"I HAD HAD IT WITH 60-HOUR WORK WEEKS, AND I DIDN'T SEE HOW THAT BLENDED WITH HAVING YOUNG KIDS."
—DEBORAH KOVACS

BUYER'S GUIDE TO
24-PIN PRINTERS

BY ROGER HART

HIGH-QUALITY TYPE PLUS SPEED AND GRAPHICS



An overhead view of the Okidata 393, which offers four print speeds: 120 characters per second (cps) in Letter-Quality mode; 180 cps in Near-Letter-Quality mode; 360 cps in Utility mode; and 450 cps in High-Speed Draft mode. The selection panel in front allows you to choose different fonts and speeds.

A few years ago, when people went looking for high-quality computer printers, they eyed daisywheel (or letter-quality) printers. However, the new 24-pin dot-matrix printers produce copy that can easily pass the scrutiny of any but the fussiest businessperson; only on closer inspection will you see the "dotty" look that distinguishes this dot-matrix print from daisywheel or electric-typewriter print. Like most dot-matrix printers, the 24-pin models are fast and create beautiful graphics. And they're priced as low as $499.

These 24-pin printers are rapidly taking over the market from daisywheel and the older 9-pin dot-matrix models. NEC Information Systems, which once made *only* daisywheel printers (Spinwriter series), now makes a whole line of 24-pin dot-matrix printers (Pinwriter series). According to Dataquest, a computer industry market-research firm, 24-pin printer sales are projected to grow from 100,000 in 1984 to more than a million by 1989, making it the fastest-growing market segment.

KANJI CHARACTERS

The United States may lead the world in personal computer design, but the Japanese lead in printer technology. And there's a good reason why that's true. The Japanese language, even in its simplified *kanji* form—used for most

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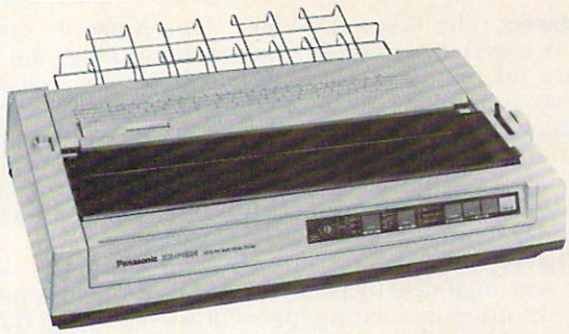
ROGER HART *wrote "Selling Yourself," which appeared in the May issue.*

The Toshiba 321SL has an insulated sound cover that does a good job of reducing noise when printing.



The Panasonic KX-P1524 is a wide-carriage printer that can hold 16-inch paper—great for large spreadsheets.

public communications, such as newspapers—has a bewildering variety of individual characters. What if English had several thousand symbols from which to make words? Many letters and words would look similar.

Let's jump back to printers. The familiar dot-matrix models have nine pins (or wires) that form the image on the page. That's okay for printing English characters, but forming Japanese characters with a 9-pin printhead is like using a big paintbrush to paint the Mona Lisa. The Japanese language demands greater attention to fine detail—hence, the 24-pin printer is a logical step forward.

LOOK AT THE SPECS

In the accompanying chart, we've listed thirty-eight 24-pin printers, ranging in price from $499 to $1,995. While the more expensive printers may deliver slightly better output, the higher costs probably include better user controls, a wider carriage, a larger buffer (one page is about 2K), higher print speeds, and more typestyles. In other words, if you buy one, you might be paying for features that aren't important to you. Here's a closer look at those features.

Speed. Twenty-four pin printers have a number of advantages, especially for home-office and business uses—fast-draft printing, for example. Most will churn out 200 characters per second (cps); some much more. While the print quality in draft mode is not presentation quality, there are times when a quick draft is all that's needed. In letter-quality mode, only the most expensive 24-pin printers break the 100 cps barrier. But that, of course, is still quite fast by daisywheel standards.

In addition, some of the new 24-pin models come with special insulated sound covers that reduce the loud noise the printers produce when in NLQ mode.

Additionally, printers that offer several type sizes often print at different speeds for each pitch. For example, the Nissho NP-2410 has a draft speed of 540 cps when it's in 18-pitch mode, but only 360 cps in 10-pitch mode.

Paper Handling. Many 24-pin printers come in wide carriage models and will print on 16-inch-wide paper. In addition, all printers will handle continuous-form pin-feed paper. Both these features are useful for preparing financial reports.

Some 24-pin printers also have automatic sheet loading. Just place the paper at the back of the roller, press LOAD (or close the roller), and the paper pops into the proper printing position. You don't have to worry that the printhead will start too high or too low on the page.

The IBM Proprinter X24 and the Toshiba P321SL even allow you to slip in single sheets of paper without having to remove the pin-fed fanfold paper—useful if you want to interrupt your normal work to "jot" a quick note on personal stationery.

Finally, because 24-pin printers are *impact* printers (unlike laser printers), they can strike through and print the multicarbon forms on which so many businesses depend.

Fonts and Typestyles. Today, with the desktop-publishing craze and related character-generation software, fonts and typestyles are "in." Few of the 24-pin printers restrict you to a single typeface. Most have several typefaces built-in, and you can buy other fonts in plug-in cartridge or card form. (Font cartridges cost about $50.) Companies that make both laser and 24-pin printers, such as NEC, Epson, and Toshiba, often offer the same typestyles for both printers. Many of these printers can also use fonts downloaded from your computer, a potentially useful feature for desktop publishing.

Multistrike Ribbons. If you're looking for the ultimate in print quality, several printers have an optional multistrike ribbon (noted by MS in the chart) that produces a sharper image than the more common fabric ribbons. In the past, multistrike ribbons—with mylar film and fine-ink coatings—were used only with daisywheel printers. With the proper font selection and ribbon, some 24-pins produce print of a quality that nearly equals a laser printer's—at a much lower cost.

Graphics Resolution. The Apple LaserWriter laser printer, generally considered to produce impeccable print, offers graphics resolution of 300 dots per inch (dpi). Some of the 24-pin printers in our chart offer 360 x 360 dpi resolution. However, the two figures are not directly comparable. The laser printer will produce a better-looking page; the dots it produces are smaller and don't overlap as much as those produced by a dot-matrix printer.

Nonetheless, 360 x 360 is fine resolution. Most printers shown here offer 180 x 360, and that is more than adequate.

SPOT THE DOTS

the lazy dog.
the lazy dog.
the lazy dog.
the lazy dog.

The above printouts were done on an Epson EX 800 printer (a 9-pin model) and an Epson LQ 800 (a 24-pin model). From these "blowups" you can see that the dots are closer together—and thus less noticeable—on the 24-pin model. From top to bottom the printouts are: 9-pin draft mode; 24-pin draft mode; 9-pin high-quality mode; 24-pin high-quality mode.

Scanners. The Epson LQ-2500 offers a special option that is especially handy for desktop publishing. You can replace the ribbon with an image scanner that will scan artwork and photos into an IBM PC or compatible. These graphics files can then be merged into files from many of the newer word-processing, graphics, and desktop-publishing programs. Scanning can be a slow process, and its efficiency depends largely on the ability of a given computer to process graphics information.

Software Compatibility. Are there any drawbacks to these new high-density printers? Yes—software compatibility. Printing in such high resolution requires a different printer code than the older 9-pin dot-matrix printers do. You can't just use the old printer drivers that are built into most word-processing packages. Recently released software, of course, comes with printer drivers for the most popular 24-pin models. These include the Epson LQ series, Toshiba P351, NEC Pinwriter, and IBM Proprinter XL. Most other printers are compatible with one of these models.

Many newer software packages also have provisions for changing fonts within documents—features that allow you to get the most from your printer.

What happens if your software doesn't support these new models? You'll have to use utility software that will help drive the printer. Such packages include *Fontastic* (Koch Software, [312] 398-5440; IBM PC and compatibles; $120), *Printworks for Mac* and *Printworks for PC* (SoftStyle; [808] 396-6368; $75); and *PowerPrint* (Sunray Co.; [209] 634-2052; IBM PC and compatibles, Apple II, and CP/M; $50).

THE CHANGING SCENE

A few years ago, it became clear that daisywheel printers were replacing typewriters in many homes and offices. Today, things have changed again. Laser printers and 24-pin dot-matrix printers are replacing daisywheels, which are slow and inflexible by comparison.

This transformation begs the question: What will happen when lasers drop in price? Obviously, they will take precedence over 24-pin printers, which will drop in price to knock 9-pin dot-matrix printers out of the market altogether. What happens after that is anybody's guess.■

MANUFACTURERS' PHONE NUMBERS

Alps (408) 432-6000; Brother (201)981-0300; Citizen (213) 453-0614; Epson (213) 373-9511; Fujitsu (408) 432-1300; IBM (800) IBM-2468; C. Itoh (213) 327-2110; Mannesmann Tally (206) 251-5500; NEC (617) 264-8000; Nissho (714) 952-8700; Okidata (609) 235-2600; Panasonic (201) 348-7000; Seikosha (201) 529-4655; Star Micronics (212) 986-6770; Tandy (817) 390-3011; Toshiba (714) 380-3000.

24-PIN DOT-MATRIX PRINTERS FROM MAJOR MANUFACTURERS

Printer	Price	Draft Speed cps[1]	Hi Qual Speed cps[1]	Graphics Res.	Interfaces	Buffer	Notes
Alps ALQ 200-24	$695	240	80	180 x 240	P($–$55)	7K	1 font, color, fc's
Alps ALQ 300-24	$995	240	80	180 x 240	P($–$55)	7K	color, fc's, wc
Brother 2024L	$1,295	160	96	180 x 180	P or S	1.8K	3 fonts, wc
Citizen Tribute 224	$949	200	66	180 x 360	P & S	24K	4 fonts, fc's, wc
Citizen Tribute 124	$649	200	66	180 x 360	P & S	24K	4 fonts, fc's, color (optional)
Epson LQ-800	$699	180	60	180 x 360	P & S	7K	fc's
Epson LQ-1000	$999	180	60	180 x 360	P & S	7K	wc, fc's
Epson LQ-2500	$1,399	324	108	180 x 360	P & S	8K	5 fonts, wc, fc's, color ($100), scanner $300
Fujitsu DL3300	$795	288	72	180 x 360	P or S	24K	fc, color upgrade
Fujitsu DL3400	$995	216	72	180 x 360	P or S	24K	fc, wc
Fujitsu DL2400	$1,195	216	72	180 x 360	P & S	8K	2 fonts, wc, fc's
Fujitsu DL2400C	$1,395	216	72	180 x 360	P & S	8K	2 fonts, color, wc, fc's
Fujitsu DL2600	$1,495	288	96	180 x 360	P & S	8K	4 fonts, fc's, wc
IBM 4207 Proprinter X24	$799	200	67	180 x 360	P or S	6K	4 fonts, fc's
IBM 4208 Proprinter XL24	$1,049	200	67	180 x 360	P or S	6K	4 fonts, fc's, wc
Itoh Prowriter C-715	$1,295	300	100	180 x 360	P & S	32K	fc's, color
Itoh Prowriter C-815	$1,995	400	162	180 x 360	P & S	42K	fc's, wc
Mannesmann Tally MT330	$1,799	300	75	240 x 360	P($–$79)	8K	fc's, ms color (optional, $199)
NEC Pinwriter P6	$699	216	65	360 x 360	P($–$56)	8-10K	26 fonts
NEC CP6	$860	216	65	360 x 360	P($–$75)	8-10K	26 fonts, color
NEC P5XL	$1,495	290	100	360 x 360	P($–$130)	8K	26 fonts, ms
NEC CP7	$1,160	216	65	360 x 360	P($–$75)	8-10K	26 fonts, wc, color
NEC P2200	$499	170	55	360 x 360	P	8K	6 fonts
NEC P960XL	$1,795	400	140	360 x 360	P($–$130)	16K	26 fonts. ms, wc, color
NEC Pinwriter P7	$995	216	65	360 x 360	P($–$80)	8K	26 fonts, wc
Nissho NP-2410	$1,845	360	150	180 x 360	P or S	6K	7 fonts, wc, fc's
Nissho NP-2405	$1,345	300	100	180 x 360	P or S	6K	9 fonts, wc, fc's
Okidata Microline 393	$1,399	450	120	360 x 360	P & S	19K	2 fonts wc, fc
Panasonic KX-P1524	$899	240	80	180 x 360	P & S	13.5K	fc's, wc
Seikosha SL-80AI	$549	135	45	240 x 216	P	16K	5 fonts
Star Micronics NB24-10	$749	216	72	180 x 360	P($–$129)	8K	fc's
Star Micronics NB24-15	$999	216	72	180 x 360	P($–$129)	5K	wc, fc's
Star Micronics NB-15	$1,399	300	100	180 x 360	P($–$129)	16K	wc, fc's
Tandy DMP2110	$1,295	240	84	180 x 180	P	1 line	5 fonts, wc
Toshiba P321SL	$749	216	72	180 x 360	P & S	32K	5 fonts, ms, fc's
Toshiba P341SL	$999	216	72	180 x 360	P & S	32K	5 fonts, ms, fc's, wc
Toshiba P351II	$1,399	300	100	180 x 360	P & S	4K	5 fonts, wc
Toshiba P351CII	$1,599	300	100	180 x 360	P & S	4K	5 fonts, color, wc

fc = font cards or cartridges; ms = multistrike ribbon available; p = parallel; s = serial; wc = wide carriage

[1]Speed varies according to pitch; in general, figures shown here are for 12-pitch mode.

Getting More From PC-DOS and MS-DOS

Part One

DOS-SHELL PROGRAMS: KEYS TO CONTROLLING THE DISK-OPERATING SYSTEM ON THE IBM PC AND COMPATIBLES

BY HENRY F. BEECHHOLD

I have a friend who recently switched from an Apple II to an IBM PC compatible. I'll call him David, as he prefers to remain anonymous. David said, "I'm embarrassed. I thought I was comfortable with computers, but when I bought my new machine, I had trouble with the simplest things—like formatting disks. It was so easy with my Apple; I'd boot it up with the system disk, take out that disk, put in the disk I wanted to format, and enter INIT [for initialize, synonymous with format]. But when I tried the same procedure with my clone, I got an error message. So I looked in the manual, replaced the system disk, put a blank disk into my second drive, typed FORMAT—and ruined my MS-DOS system disk. I finally figured it out, but not until I went back to the computer store and begged for a new system disk. You can use the story, Hank, but please don't tell anyone my name."

WHAT IS AN OPERATING SYSTEM, AND WHY CAN'T I IGNORE IT?

Telling a computer what to do can cause difficulties for almost anyone. Before a computer will run disk-based software, you need a special piece of software called a disk operating system, or DOS for short. When you boot up with your system disk, the DOS makes the machine practicable by loading into memory and having on disk various routines that

HENRY F. BEECHHOLD *writes the IBM column in the Machine Specifics department.*

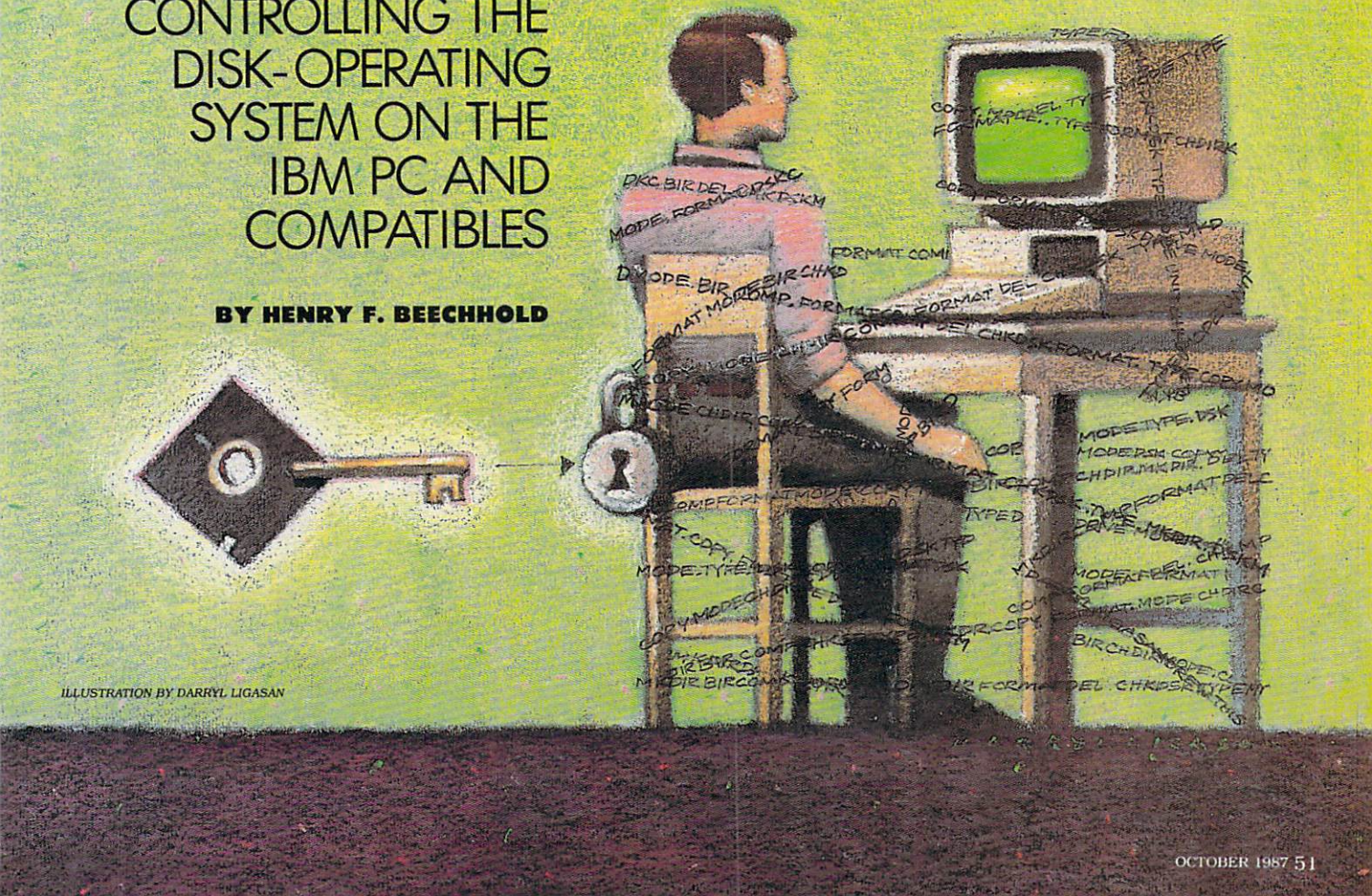


ILLUSTRATION BY DARRYL LIGASAN

perform two general "housekeeping" functions. First, DOS gives you control over operations by letting you load and run your application programs. Second, it provides a special set of commands for copying files, deleting files, copying disks, creating or removing subdirectories, formatting disks and so on.

At the software heart of the IBM PC and its family of clones and compatibles lies the DOS known as PC-DOS (on IBM's own products) or MS-DOS (on practically all compatibles). As significant as MS-DOS is in operating a PC, it ranks low on the friendly scale and requires a fair amount of "sweat equity" to master.

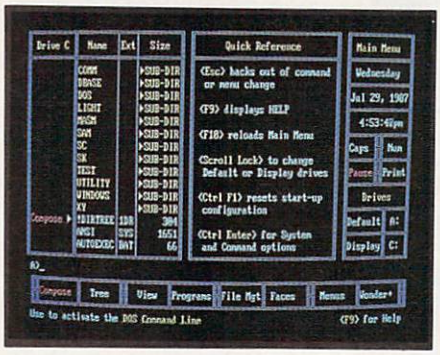
Actually, MS-DOS is itself an exacting master. For instance, to successfully format the blank disk in his second drive, David left his system disk in the PC's first drive (drive A), then typed FORMAT B: and pressed ENTER. Yet several small mistakes could make this operation fail, such as not putting a space between "FORMAT" and "B:" or putting a space between the designation for the second drive (B) and the colon (:) or simply forgetting the colon entirely. After some practice, all this may seem very easy, but wouldn't it be nice not to worry?

Of course, what's easy for you may prove difficult for me; two raw recruits may respond very differently to the same piece of software. Still, an appreciable percentage of computer users find MS-DOS a royal pain. In fact, there are so many DOS grumblers out there that several companies have developed programs—called by various generic names (DOS shells, DOS managers, DOS menus)—designed to alleviate the stress and strain of coping with DOS. We'll use the terms "shell" and "DOS shell" to represent all of these.

DOS SHELLS INSULATE AND PROTECT

Just as secretaries or assistants often insulate their bosses from the distraction of phone calls by handling the calls themselves, DOS shells can insulate you from the distracting details of MS-DOS by handling DOS housekeeping through their own, more flexible structures. A "shell" is called that because it's a program that "wraps around" another program, protecting you from DOS like a turtle's shell protects it. (In fact, DOS is itself a shell of sorts that wraps around the secret inner life of the computer.)

After you've run a DOS shell's installation program—which integrates the shell into your system—it goes to work every time you boot up with the disk on which you've installed the shell. Then, as soon as DOS has done its work of getting your computer ready to use, the shell takes over by (in most cases) putting a menu of choices on the screen. Typically, a shell will perform three kinds of DOS activities: copying, renaming, and deleting files; maintaining shells (disk-drive defaults, screen characteristics, and security options); and running programs.



One of the menus in *1dir+* (pronounced "wonder plus"). Note the listing of files and subdirectories on Drive C.

Do you want to view a file's contents on-screen? Pick that function from the menu and don't worry about how to explain the action in detail to DOS. Do you need to copy a report from your hard disk to a floppy so that a colleague can review it? Again, just choose from the menu. Do you want to search through all of your hard-disk directories? The shell will display the entire directory structure and let you pick what you want to look at by, in most shells, "pointing and shooting"—that is, moving a cursor and pressing ENTER.

Would you like to work with a menu that lists all of your programs for point-and-shoot selection? Several DOS shells include menu editors that let you set up menus for running your programs *(see screen shot)*. Along with the point-and-shoot method, some shells let you press one key to run programs, giving you two different routes to arrive at the same place. As you become more familiar with the one-key method, you'll find it quicker than moving the cursor around the screen.

A DOS-shell program is indifferent to the other programs on your disk. This means that you can run any program you wish from the shell's menu, whether DOS routines such as FORMAT or applications such as a spreadsheet. For all practical purposes, as soon as you've made your program choice, the shell disappears. It doesn't interact with the programs you're using; instead, it simply sits to the side waiting for you to finish your word processing or page design or other activity. Exiting the application awakens the shell, and its menu returns—awaiting your next choice.

DO YOU NEED A DOS SHELL?

DOS shells can act as attractive mediators between you and your system. Marilyn Ratcheson, a training manager for the Federal Railroad Retirement Board in Chicago, said, "When I began to use a hard disk, I found that the *Norton Commander* [Peter Norton Computing, (213) 453-2361] helped me to navigate and manage my files. I recommend it to friends who have a difficult time visualizing the DOS tree structure and remembering DOS commands."

Broadly speaking, there are three levels of DOS expertise: beginner, intermediate, and advanced. However, someone highly skilled at using a database system may be a novice at DOS operations, even though the database program is in many ways far more complex than DOS.

If your computer work is devoted exclusively to one or two applications—say, word processing and database development—then you'll need to learn relatively little about DOS in order to get your work done efficiently. The money spent on a shell system and time spent learning to use it might not be repaid.

On the other hand, if you're using the computer for a diversity of applications and want to keep everything neatly organized within a single framework, then a shell program may be just the thing—particularly if you have a hard-disk drive. Still, not all shells are equally accessible to beginners, since some of them require a certain amount of programming-type skills before they can be used effectively. In a sense, by the time you set up some shells, you've moved from beginner to intermediate status.

However, experienced users may find menu-based shells intrusive. As Ratcheson continued, "It [*Norton Commander*] was a terrific learning tool, but now I feel limited by it." Most DOS shells are to regular DOS what a menu-driven word processor is to a command-driven one—you make choices from a list rather than by memorizing and entering commands. Yet even though a menu-based system—whether a DOS or a word processor—is invariably easier to control, it's also often slower than

a command system. That lack of speed is one reason many advanced users avoid shells.

Another reason that computer professionals shy away from shells is economy—not the cost of the products, but cost in memory and time. Every layer that stands between you and what you want to do must be paid for. In high-speed systems, the time lost may be trivial indeed. "No matter," said Nicholas Petreley, president of Counterpoint, a computer consulting firm in Trenton, New Jersey. "I object to anything that gets in the way. Learning DOS was a small price to pay for a 'clean' system. Besides, the memory a shell eats up may be just the memory I need to finish a large spreadsheet."

Still, beginners will be happy to have DOS fussiness replaced by an uncomplicated system of menu choices. Intermediate users will be just as pleased to be free of DOS. And, if they've chosen the right shell, they'll be able to bypass layers of menus by taking advantage of keystroke shortcuts.

THREE TYPES OF DOS SHELLS

MS-DOS shells can be classified into three major types: One, the "full-service" shell that not only supplies menus, but also allows you to create custom menus to supplement (or, in some cases, supplant) the menus that come with the shell program; two, a menu-based shell that insulates you from DOS, but doesn't allow for customization; and three, the "background" shell that enhances DOS commands, but does not replace existing commands with a menu.

Because of the difficulty of MS-DOS, dozens of shells have come to market. I'll begin this month by looking at the three basic types—each distinctively different from the other, yet as a group covering the range of possibilities—so that you can begin to determine which shell will best protect you from DOS. Next month I'll go into a detailed examination of several excellent DOS shells.

Type One: These are the most elaborate shells, offering menus within menus almost to the point of distraction. A prime example is *1dir+* (pronounced "wonder plus"; Bourbaki Inc., [208] 342-5849), which lets you set up unlimited custom menus. In addition to the point-and-shoot method of control, these shells let you define function keys (and often control keys) as substitutes. For example, you might want CONTROL-D to stand for the DOS command "dir" in order to catalog a disk's directory (a listing of programs, files, and subdirectories). Built-in editors are usually included; they're useful for examining text files or setting up batch files to further control DOS. On-line help is almost always available. Neither intermediate nor advanced users will have trouble with Type-One shells, but advanced users may grow impatient with the layers of menus.

Type Two: This type of shell is a more common example of the current generation, offering a menu system of DOS commands, programs, files, and directories. Unlike Type-One shells, these don't let you build custom menus. And some, such as *Q-DOS II* (Gazelle Systems, [801] 377-1288), do not provide point-and-shoot file selection. Instead, *Q-DOS II* lets you start a program by pressing a function key to access the DOS command line. Then you either type in the name of the program you want to run, or automatically transfer its name from the highlighted directory by pressing a function key.

Type Three: This is my favorite type of shell program: There's no menu! For instance, with *TopDOS* (FrontRunner Development Corp., [818] 376-1322) the only sign of the shell's presence is the addition of a second greater-than sign to the normal DOS prompt. So what's the advantage over using DOS straight up? In addition to enhancing DOS commands with a number of extensions (such as *TopDOS*'s DIR/B command, which lists files written BEFORE a specified date or time), it gives you rapid access to any program, directory, or system function. At your option, DOS commands are automatically completed after you type in the first few letters. While this type of shell is not exactly a menuing system, it works as a disk-and-file manager that enhances DOS.

WHICH SHELL IS FOR YOU?

The simplest answer to this question is to look for the most features for the least cost. But simple answers may not be the best, because the shell's range of features should be keyed to your range of operations.

If, for example, yours is a single-user system with which you plan to do nothing but a few basic DOS operations—such as disk formatting and file copying—and run a small number of programs, then you'll need no more than a simple shell with a limited number of features. A Type-Two shell program like *XTREE* (Executive Systems, Inc., [818] 990-3457) is more than adequate.

But suppose you're the boss and you want your employees to have access only to the programs for which they're responsible. This requires a fairly elaborate DOS shell with custom-menuing, security, and, perhaps, an "audit trail" (log of system users), such as that provided in *Master Control* (Master Control Systems, Inc., [804] 420-3627), an example of a Type-One shell.

Type-Three shells would be appreciated best by an intermediate user who is reasonably comfortable with many MS-DOS basics, but who is also tired of DOS's inflexibility and wants more control.

BEYOND DOS SHELLS

Will DOS shells always be needed? Apparently not. When IBM introduced its Personal System/2 line of computers this past April, they announced a forthcoming graphic interface that's supposed to be similar to that of the Macintosh and Amiga or to the existing MS-DOS graphic systems—Microsoft's *Windows* and Digital Research's *GEM*.

All these mouse-based, icon-and-menu systems put picture symbols between you and DOS, simplifying such tasks as copying or deleting files, creating subdirectories, and formatting disks. In fact, *Windows* and *GEM* are like DOS shells in that they also insulate you from DOS. However, these two interfaces run painfully slow on a standard PC whose microprocessor operates at 4.77MHz. If you want to use either system regularly, you'll need a faster machine.

Even without a graphic interface, some MS-DOS compatibles are making life easier for users by including DOS menu systems. These include the new Tandy 1000 HX and the Vendex Turbo 888-XT compatible. And some programs, such as *PFS: First Choice*, offer shell-type menus that help you with MS-DOS commands. But if you don't have one of these graphic interfaces, compatibles, or programs, a DOS shell might be just the key to control your computer. ■

EDITOR'S NOTE: *This is the first installment in our new "Getting More" series. Next month, Part Two of "Getting More from MS-DOS" will explore further ways of controlling DOS, including a mini-buyer's guide for DOS shells. Later articles in the series will deal with getting more from databases, spreadsheets, utility programs, documentation, and desktop programs, as well as other software-related topics.*

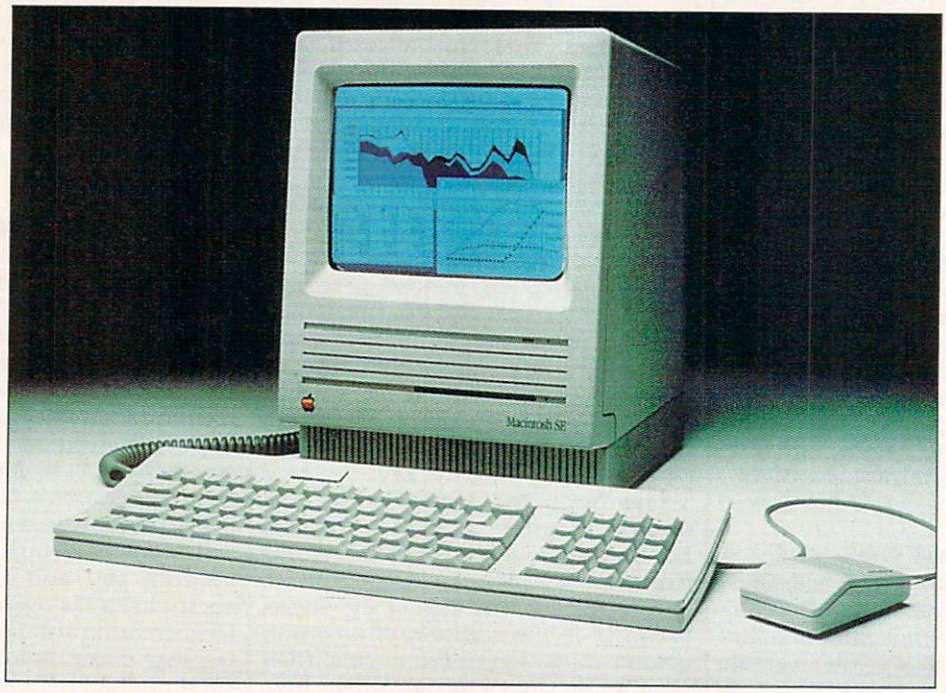
INCLUDING PREVIEW OF HYPERCARD
HOT, NEW SOFTWARE FOR EVERY MAC

HANDS-ON REVIEW

MACINTOSH SE

MEET THE FAST, EXPANDABLE NEW MAC

BY DAVID HALLERMAN



Apple has always touted the Macintosh as a computer that's easier to use than other machines—the so-called "computer for the rest of us." Yet the same quality that makes the Mac so approachable—its graphics-oriented interface—has also made it more sluggish in most operations than MS-DOS computers, detracting from its ease of use.

However, since the introduction in early 1986 of the speedier Macintosh Plus, the Macintosh's reputation, along with its sales, has grown dramatically. At first glance, the Macintosh SE—with the same one megabyte of memory, 9-inch black-and-white screen, and SCSI port (Small Computer System Interface, used mainly for connecting hard-disk drives)—doesn't appear much different from its predecessor. And at their cores, the two computers are not so dissimilar; they'll run almost all of the same software packages. But the SE contains several improvements and a few extras that make it a true upgrade of the Plus.

The SE's main departure from earlier Macs is the addition of an expansion slot—the first slot ever built into a Macintosh. Actually, it's not officially a slot, but a "96-pin CPU bus connector." Whatever you call it, this internal connector makes it easier to add hardware extras such as an 8088-microprocessor card to run MS-DOS software, a color monitor interface, more memory (RAM is expandable to 4MB), or a faster-running 68020 microprocessor with 68881 math co-processor (both used by the powerful Macintosh II).

You probably won't be able to install all this extra hardware at once (although some boards will piggyback on others, especially ones from the same manufacturer), but the add-on capabilities make the SE much more flexible than previous Macs.

BUILT-IN DRIVES

While the expansion connector provides users with a link to future technologies, the SE also contains several enhancements for the here and now.

The SE offers the convenience of two internal drives in one of two con-

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MACINTOSH SE SPECIFICATIONS

PRICE: $2,769 (with two 800K 3.5-inch floppy drives); $3,569 (with one 800K floppy drive and one 20MB hard-disk drive)
KEYBOARD: $129 (standard, with 81 keys, including 18-key numeric keypad); $229 (extended, with 105 keys, including 15 function keys, 10-key cursor pad, and 18-key numeric keypad)
MICROPROCESSOR: 68000, running at 7.83MHz
MEMORY: 1MB, expandable to 4MB (RAM); 256K (ROM)
GRAPHICS RESOLUTION: 512 x 384
PORTS: two 8-pin serial, 25-pin SCSI, 19-pin floppy drive, two ADB, mono sound (with four-voice sound chip)
INTERNAL CONNECTOR: 96-pin CPU bus connector
POWER: 100 watts
HARDWARE INCLUDED: ADB mouse, clock/calendar, fan
SOFTWARE INCLUDED: *System, Finder, Font/DA Mover, Teach Text, Disk First Aid, HD Backup, Easy Access, Hypercard, MultiFinder* (see November's Machine Specifics)
DOCUMENTATION: *Macintosh SE Guide* (252 pages); *Macintosh Utilities User's Guide* (54 pages); Macintosh Quick Reference Card (two pages); *Your Apple Tour of the Macintosh SE* (disk)

figurations—either dual 800K 3.5-inch floppy drives or one floppy drive and one 20MB hard drive. (Until now, the Mac was sold with only one internal floppy drive.) Since the Macintosh is difficult to run with only one drive, either configuration is a substantial bonus, especially the hard drive.

In the course of writing this review, I frequently carried a Macintosh SE with a hard drive back and forth between my home and my office at the magazine. While I wouldn't recommend transporting a Macintosh on a regular basis (it's no lightweight), the SE's hard drive always booted and always ran—even after enduring the jarring knocks of the New York City subway system.

Should you opt for the SE with twin floppy drives, you can still attach a hard drive to the SCSI port, just as you could with the Plus (you can also add a third floppy drive, a first for the Mac). But with the SE, your data moves between hard drive and memory about 75 percent faster than with the Plus. This extra speed is a result of upgraded code in the SE's 256K ROM (the same ROM chip used in the Macintosh II; twice as large as the 128K ROM in the Plus).

The SE also has faster screen routines than the Plus. Because of the Mac's graphics orientation (it creates both text and pictures from pixels), it not only has to redraw the screen every time you scroll a page, it also has to check the screen just in case you've made any changes. This kind of screen housekeeping used to consume a noticeable amount of time (especially when scrolling through documents), but the SE spends a third less time on screen tasks—and more time actually doing your work.

CHANGES: COOLER, LOUDER, A BETTER KEYBOARD

Up to now, the Macintosh's built-in clock/calendar was powered by a hard-to-find battery cell that lasted less than two years. The new Macintosh timepieces are charged by a lithium battery that can last up to 10 years. And no longer do you open a little door in the back to replace the battery; it's soldered to the SE's motherboard (what service problems does this portend in 10 years?).

But the space where the old battery sat is still useful; a fan has taken its place. Because the SE is constantly cooled by the fan, the unit doesn't become hot, as older Macintoshes tended to, even after hours of use.

Unfortunately, some solutions bring new problems. In this case, what was once a silent computer is now an extremely loud one. It's not that I'm overly sensitive to noise; I installed a fan on my first computer, an Apple IIe, two days after I brought it home. While the sound of the SE's fan was not too distracting amid the hubbub of the office, its high-pitched whine was oppressive at home initially, and I'm still not used to it.

With the addition of the fan, the Mac is now being cooled by forced air rather than by convection currents, so the heat vents have been moved from the top of the computer to the front grill, below the monitor. This is the SE's most noticeable external design difference; it's a minor change, but I like it, just as I like the new pale gray (officially *platinum*) casing more than the original beige.

Not only has the battery been moved, but the speaker also has changed places—from the left side to the front. It's a subtle enhancement, but now that the sound projects right at the user, it's louder and a lot more intelligible, especially for functions such as speech synthesis.

More changes: The mouse and keyboard are now attached via Apple's new ADB (Apple Desktop Bus) connectors, which are the same connectors used in the Apple IIGS. The ADB standard allows up to 16 input devices to be simultaneously connected to a Macintosh in daisy-chain fashion. Along with the mouse and keyboard, ADB-type input devices include graphics tablets, joysticks, trackballs, and light pens. The ADB standard also means that the SE keyboard and the smaller IIGS keyboard are interchangeable, as are the mice, which are exactly the same.

Apple now offers you a choice of two different keyboards for the SE, but in either case they cost extra—one at $129, the other for $229 *(see "Macintosh SE Specifications")*. Compared with my reservations about previous Macintosh keyboards, I'm particularly fond of the $129 one. It has a crisper feel and a better layout (including a wide right SHIFT key and an enlarged RETURN key). Apple also has finally included both an ESC key and a CONTROL key. Just as with the Plus, there's a separate 18-key numeric keypad that's handy for numerical input.

Finally, the power supply delivers more watts than earlier Macs' did, which means there's plenty of energy should you add more memory or any board to the SE's slot.

THICKER MANUALS

With the introduction of the SE, the Macintosh's manuals are now thick. Don't worry, though. Thick doesn't mean dense, nor does it mean that the new Macs are any harder to use. Instead, Apple has finally realized that typical users need more than just a complete beginner's course; they also need reference information and documentation for more advanced use. In this case, more is certainly better.

Continuing in the Apple tradition, the manuals are clear and inviting, with copious illustrations. Those thicker manuals include the *Macintosh SE Guide*, with help on everything from setting up the computer and Macintosh system basics to a primer on desk accessories and how to clean your mouse. There's also a *Utilities User's Guide* for the supplied programs such as *Font/DA Mover*—which lets you customize your system with your choice of fonts and desk accessories—and the *Hard Disk Backup* program. The latter is rudimentary and is one of the system's weak links.

The third bit of printed documentation is a Quick Reference Card with helpful information such as "Common Keyboard Shortcuts" (for example, pressing COMMAND-D to duplicate a file) and "Managing Windows" (hints including how to simultaneously close all windows by pressing the OPTION key as you close one).

The last piece of documentation is a disk (*Your Apple Tour of the Macintosh SE*) that interactively shows everything about the Mac system from icons and mouse control (pointing, choosing, and dragging) to selecting text and resizing windows.

IS IT WORTH IT?

Not only has Apple always marketed the Macintosh as a computer that's easy to use, but the company also has always sold it dearly, and the high pricing continues with the SE. At $2,769 suggested retail (plus more money for the keyboard), the SE costs about twice as much as some

good MS-DOS compatible computers. However, whether or not this high price is a smart value is something you have to determine for yourself.

Consider this: While the Macintosh's capabilities and ease of use aren't unique (you can find elements of them in the Amiga, Apple IIGS, Atari ST, and MS-DOS machines), the computer's particular combination of mouse-and-icons interface and a wealth of superb software place the Mac in a special class (although some still bemoan its lack of color).

For graphically intensive applications such as desktop publishing, a Macintosh is still the most straightforward computer to operate. For tasks such as communications (which so many people find difficult), software developers have created solutions for the Mac that simplify going on-line. And with the expansion slot and the increased running speed of the SE (especially the hard-drive version), the main complaints about the Macintosh have been answered.

10 MORE PROGRAMS THAT MAKE THE MACINTOSH WORTH BUYING

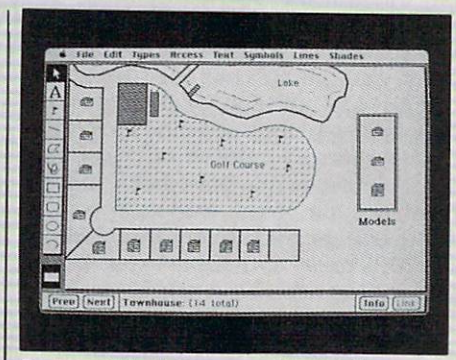
This section is a bit of a cheat because there are more than 10 great programs that run on the Macintosh. So take this selection as a sampling of the excellent, elegant software packages that make the Macintosh special.

Adobe Illustrator. PostScript—the page-description language used by Apple's LaserWriter and many other laser printers—is at the heart of desktop publishing. Adobe Systems, the developers of PostScript, has released a spectacular drawing program that outputs directly in PostScript in order to take complete advantage of the LaserWriter's 300 dots-per-inch resolution, as well as the even-higher resolution on the Linotronic 100 and 300 professional typesetting machines. Adobe Systems, Inc., (415) 961-4400. $495.

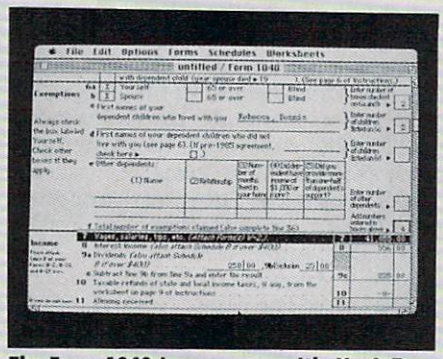
Business Filevision. Back in the Macintosh's early days, there was so little software available that just about any program made you ooh and aah. "Look at the icons!" "Can you believe those pull-down menus?" In those days, Telos Software introduced a database called *Filevision*. Instead of text fields such as name, address, or Social Security number, your database was designed around pictures (although you could have text-only fields, too). In the advanced version, *Business Filevision*, the graphical powers are even greater. Whether you're creating a database that includes every employee's picture or an educational database for learning anatomy, this is the one to consider. Marvelin Corp., (213) 450-6813. $395.

Excel. With complete business graphics capabilities and the ability to use Lotus *1-2-3* files, *Excel* is a spreadsheet that provides an exceptional combination of power and relative ease of use to people involved in budgeting, forecasting, or any other numerical and financial analyses. Microsoft Corp., (206) 882-8080. $395.

Guide. Just like *Filevision*, *Guide* exploits the Macintosh's graphic capabilities in a special way. Instead of organizing databases, though, *Guide* creates documents. And not just documents with graphics, either (as all Macintosh word processors can do), but on-screen documents that allow you to move between related concepts (either words or pictures) at will. You read *Guide* documents as you would a reference book or a magazine; that is, you don't necessarily read it straight through, but jump around as your interest leads you. For example, a *Guide* document could consist of a map, and whenever you clicked on the name of a city, it could show you a capsule history of that city. OWL International, (206) 747-3203. $135.



***Business Filevision*, a graphic database.**



The Form 1040 is on-screen with *MacInTax*.

MacInTax. Software for doing taxes is rarely a kick—but some programs are more fun than others. While I won't say that *MacInTax* makes tax preparation something you'll long to do, it does make the process easier than anything else on the market. No other program shows you the actual IRS forms on-screen; all you do is fill them in just as you would the paper forms—but it does all the calculating. And when you're done, just print out each needed form and schedule and sign; the IRS will accept them. SoftView, (805) 388-2626. $119.

MicroPhone. I'll say right up front that *MicroPhone* is the best telecommunications program I've ever used on any computer—including the Macintosh. Now in version 1.1 (with a highly improved version 2.0 coming a little later this year), *MicroPhone* makes going on-line a pleasure. Its most special quality is the "Watch Me" mode that records any on-line task (such as logging on or downloading) on disk the first time you do it; you can then replay the task repeatedly. Software Ventures Corp., (415) 644-3232. $149.

Microsoft Works. The phenomenal success of *AppleWorks* for the Apple II series led to a host of imitators—integrated packages easy enough for beginners, yet with a wealth of features so that experienced users didn't have to leave them behind. *AppleWorks*'s author, Rupert Lissner, was also behind Microsoft *Works*. By combining a word processor, database, spreadsheet, and communications module, *Works* might be the only productivity program most people will ever need. Microsoft Corp., (206) 882-8080. $295.

MockPackage+. Desk accessories—those little programs you access by pulling down the Apple menu while running your main program—have always been an attraction of the Macintosh. Nowadays, some of those programs aren't so little, and among the best is *MockPackage+*, a collection of four integrated accessories: a word processor, a communications program, an accessory for business graphics, and a print program. CE Software, (515) 224-1995. $35.

MORE. The publishers of *MORE* probably gave it that name because they're the purveyors of the first outlining program, *ThinkTank*—and this is a lot more. Beyond outlining, *MORE* will help you create tree charts (good for organizing projects, for instance), bullet charts (especially appropriate for presentations), and schedules (with its calendar feature). *MORE*'s flexibility makes it suitable for everyone from businesspeople to educators. Living Videotext, (415) 964-6300. $295.

PageMaker 2.0. While *PageMaker* is not the sole excellent page-layout program for desktop publishing on the Macintosh (there's also *Ready, Set, Go! 3.0* among others), version 2.0 offers one feature that makes it special: MS-DOS compatibility. No hardware tricks are needed; rather, *PageMaker* accepts document files created with the PC version of the program and vice versa. *(See the desktop-publishing section in next month's issue.)* Aldus, (206) 622-5500. $495. —D.H.

HYPERCARD

HOT, NEW FREE MACINTOSH SOFTWARE POINTS TO THE FUTURE OF INFORMATION—AND IT CLICKS

BY NICK SULLIVAN

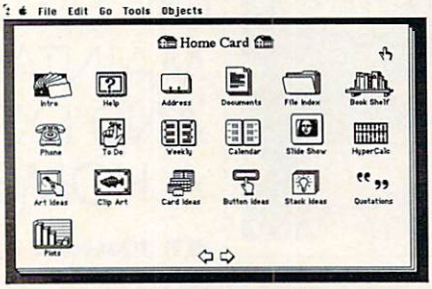
Apple has just upped the ante—again. First came the Macintosh and its mouse, graphics, LaserWriter printer, and desktop-publishing boom—which the whole industry is chasing. Now comes *HyperCard*. This stunning Macintosh software, now supplied free with every machine, pole-vaults today's standards and foreshadows the future that technologists have been painting. The Information Age has come of age.

Imagine a stack of 16 million cards. Each card is represented on a standard Macintosh screen and can be composed of several elements—including text, graphics, voice, music, animation, and video. Laid end to end, these 16 million cards would stretch for about 2,300 miles—but they're all packed inside your computer. Every card can be linked to 60,000 other cards. By pointing at a visual "button" on the card and clicking the mouse on the button, you can see one of the linked cards in less than half a second!

To pick a mundane but easily visualized example, a standard Rolodex file could be a stack of cards. You call up a card (FIND BILL, for instance), and click a button to see his photograph. Click another button to see copies of past correspondence, a biography, or a resume. Another click will dial his phone number. And yet another click will list his favorite books and movies or recipes. Anything you want can be attached to that one card.

Take a screen shot of an automobile-parts manual. Click on a wheel to see all the parts associated with wheels. Keep clicking to see the manufacturers, diagrams, and prices of the parts.

Take a screen shot of a tiger. Click on its eye, and you might see a stack of cards fly across the screen, each with a different kind of eye. Click again to see a scientific drawing. If something in the drawing reminds you of artistic perspective, click once more for an essay on perspective (a card can hold about 32,000 characters or more than 15 pages of scrolling text).



***HyperCard* consists of three disks, one of which contains the program itself. The Home Card provides a number of starting points for creating your own information system.**

WHAT IS IT?

HyperCard is not a database, a spreadsheet, or a word processor—although you can file, calculate, and write with it. It's not a paint program—although it has very powerful paint functions. It's not a programming language—although you can write "scripts" in English that navigate through data like Captain Cook sails through a coral reef.

HyperCard is an erector set with all the tools and parts needed to organize information the way people think—following trains of thought. And the program has a very robust search-and-sort function that allows you to find this information almost instantaneously.

As amazing as the software itself is the fact that Apple is giving it away, which could accomplish two things—increase sales and encourage the creation of new information systems. *HyperCard* is system software that comes with every Macintosh (1MB of RAM is required to run it).

You can create and store up to 16 million cards in one stack and make as many stacks as your computer can store. One thousand cards with graphics consume about 1.4MB of storage; 1,000 cards with text take up about 100K. (Sound and animation will generally occupy more memory than text or even graphics.) Although you can use the program with one disk drive, two are recommended; a hard-disk is preferable.

WAIT! THERE'S MORE!

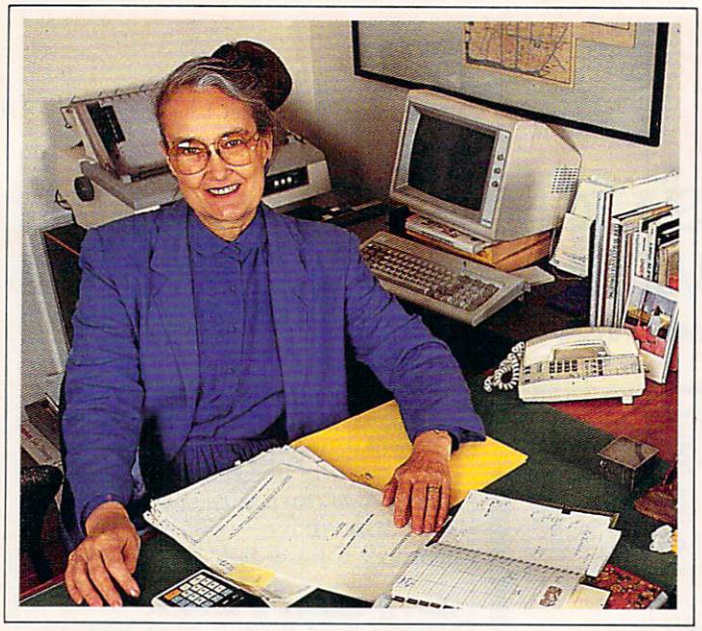
HyperCard doesn't come with the aforementioned tigers and auto-parts manuals as part of its repertoire. That data has to be logged in. What makes *HyperCard* different from other programs is that every new Macintosh owner—from schoolchild to Unix developer—will have and use it. And that means people—whether they think in visual, textual, or musical ways—will log in everything under the sun and make whatever connections their minds dictate.

You begin to design your own *HyperCard* information system in conventional Macintosh style—by making choices from pull-down menus (you can even "tear off" the menus and move them around). You may choose from the preset stack ideas (such as calendars, to-do lists, Rolodexes, and phone dialers) to create your own web of information. You can customize each card with clip art or design your own graphics. When your stack is completed, you can view it on screen or print out text and static graphics.

At first, Apple sees the main users of *HyperCard* as businesspeople setting up training systems (Apple is even using it to train its own employees), educators, and librarians—or anyone else who needs to keep track of a large body and variety of information that's always changing.

HyperCard will give birth to a wealth of "hypermedia," which futurists have been predicting ever since the term was coined in the 1960s. More important, *HyperCard* is the first piece of software bundled with a computer that provides nonprogrammers with the tools to set up and customize their own information systems.■

NICK SULLIVAN *is a senior editor for* FAMILY & HOME-OFFICE COMPUTING. *He previewed* HyperCard *at Apple Computer's Cupertino, California, headquarters.*



PHOTOGRAPH BY JIM KNOWLES

Home-Office SHOPTALK

AN EXPERT FIELDS QUESTIONS ON SETTING UP, MAINTAINING, AND EXPANDING A HOME BUSINESS

BY JOANNE H. PRATT

I was fired into a home-based business. For 20 years, I hid the fact that I worked from home. But in 1980, I became curious about what people would do with a new tool—the personal computer—that lets them work at any time and in any place. Now about 20 million people do some of their work at home. Although not all of those people use computers, the machines' existence has helped make home-based work not only credible, but indeed, fashionable. My primary business has become research and consulting on home-based work of all kinds. In this and future issues, I will try to answer your questions about any aspect of working at home.

Send questions to ShopTalk, FAMILY & HOME-OFFICE COMPUTING, *730 Broadway, New York, NY 10003.*

Q: How can I start a home-based business? I'm tired of working for a company. I already have a home office with an IBM PC. —V. GHIO, *Houston, Texas*

A: Before you leap from the corporate window, ask yourself a few questions. What can you do that other people are willing to pay for? Since you're presently employed, first take a look at what you're being paid to do. Could any part of your present job be set up as an independent business?

If so, how do you proceed from a full-time job to a home-based business? A better route than quitting (or being fired) is to discuss the possibility of selling your services as a business subcontractor to your employer. With one contract in hand—providing you with a partial income and a reference—you could market your services to other clients. In effect, that is how I started my business. I was "let go" with a consulting retainer that set me up for the first two years.

Remember when you negotiate fees to include prorated costs of the benefits and expenses that your former employer used to pay. Social Security taxes, pension, vacation, and health-insurance costs will all come out of your pocket. Whether or not you take a tax deduction on your home office, you still will need to allocate your office overhead costs. The cost of your desk light bulb should come out of your business pocket, not the grocery account.

Q: My home business is too small to afford both a computer and a typewriter. But it drives me crazy to have to go through *WordStar* just to type an envelope or one label. —J. STRASBURG, *Mountain View, California*

A: My life was totally changed when I learned how to use the MS-DOS statement COPY CON PRN. Try this: Position your envelope in the printer as far to the left as possible. At the DOS prompt, type COPY CON PRN and press the RETURN key. Use the space bar (not the tab) to move the cursor over on the screen to position the name and address. It will take you a few tries to judge the correct distance. Type the first line, proofread it, and press RETURN. Continue typing each line and entering it by pressing the RETURN key. When you are finished, press F6 to print the block.

Other people have told me that dot-matrix printers may not handle envelopes (because of their thickness) as well as my letter-quality printer does. You'll have to experiment.

It's a bit laborious to get the spacing correct, but once you do, you can fill out forms. If the form is set up as a box, such as an express-mail label, you may need to print one line and move the following line into position before repeating the command.

For correspondence, I have set up a standard letter-and-envelope form that I read (CONTROL-KR on my *WordStar*) into each new letter file. I copy the name and address onto the envelope, which is formatted as a separate page. There are various other ways of printing envelopes but those two work well for me.

Q: Now that I'm working at home—that is, now that I am getting paid to work at home—my neighbors still keep calling or dropping by to chat. They don't seem to realize that I have to keep business hours. —E. SHUTT, *Cambridge, Massachusetts*

A: You are not the only one with that problem. Try asking people who telephone if you can call them back at a specific time. If that doesn't work, say "I'm sorry, but

JOANNE H. PRATT, *president of Joanne H. Pratt Associates, Dallas, Texas, has 28 years of experience in operating home-based businesses. Pratt Associates conducts research and consults for private and government clients.*

someone is with me in my office right now" or "I'm in a meeting." (You can see the disadvantage of not having a secretary at home.)

Drop-in neighbors may be continuing old habits. Establish a new pattern by suggesting that you have lunch together from noon to 1:00 or a drink after work. (Go to a restaurant or have a pizza delivered so you won't have to cook.) It may take some time for it to sink in that you mean business.

Q: I've read with interest your magazine's articles on computer-based home businesses, and I'm ready to start! Where do I begin to find home-based data-processing work and what specific software and hardware will I need? —H. BOURQUIN, *Los Angeles, California*

A: Your best bet is to try working from home as a company employee rather than as a freelancer or an independent contractor. Most people who work at home as employees have already been working for their employers on-site. Or they may have responded to the calls for homeworkers by one of the few formally established corporate telecommuting programs. Because Los Angeles is actively promoting home-based work, you're in a good location to find companies advertising home-based jobs.

If not, you sound energetic enough to pioneer telecommuting. This is what I would suggest: First, you need to persuade a prospective employer to hire you—even though he or she won't be able to see you at work. Scan your local newspaper's help-wanted ads under "data processing." Look for ads that request help during evening or weekend hours. If you can work at those unpopular times, you'll have a convincing argument.

Second, be sure that you are paid the going rate for data-processing employees. If you're hired, your employer will provide you with an equipped workstation and a wage-and-benefit package. I would not recommend offering your services as an "independent contractor" without setting a wage rate that also incorporates Social Security, medical insurance, other benefits, and overhead.

For someone with one year of data-processing experience, salaries in the Los Angeles area range from $1,000 to $1,300 per month—with benefits varying according to the employer. In comparison, many data-processing jobs call for part-time or temporary workers. They are often paid hourly wages of $6–$8 that include *only* social security taxes. Again, be aware that a higher income based on hourly wages may leave you with a lower net figure.

As for hardware and software, employers with formal telecommuting programs usually supply both, sometimes requiring the worker to pay a fee for the terminal. If you take the pioneering route I've suggested, there are several ways you could work. You could supply the computer and—using the employer's software—enter data on a disk that you would then deliver to the employer for transfer into a mainframe computer. Or you could link your computer as a terminal to the mainframe by means of a modem.

Q: I am a professional proofreader working for both a publisher and a typographer. I want to work on my own as a proofreader and typesetter. Can you advise me whether this is possible and, if so, what equipment I would need? —G. BOAMAH, *Staten Island, New York*

A: Using a personal computer, you can both proofread and encode a disk for final typesetting. There are two problems you'll need to work out. The first is your client base, which will govern the software you need. Say you freelance your services as an independent business owner—both to your current employers and to other publishers and typographers.

Investigate the software your prospective clients use now. For example, if the publisher receives hard-copy manuscripts, you would use a computer to type the text and spelling-checker software to proofread the file. (You can build up a specialized dictionary to supplement the standard vocabulary that is supplied.) Or if the publisher receives manuscripts on a disk, you would do just the proofreading.

Next, you must understand the typographer's capabilities. Nowadays, typesetting houses will accept a manuscript on disk, strip off the word-processing codes, and add typesetting codes. You could contract to do that task. The actual typesetting is performed by a Compugraphic, Varitype, or other brand of typesetting machine. The codes control the style, size, and placement of type of Garamond, Helvetica, and the many other type fonts.

If you choose that route, you'd do best with an IBM PC or compatible, a comprehensive word-processing package, and a spelling checker. Microsoft *Word* or *WordPerfect* would be good choices. One advantage of *WordPerfect* for your business is its popularity. Documents submitted by clients on disks are likely to be coded in *WordPerfect*.

You can also use a Macintosh, as many typesetting shops now accept Macintosh disks. *(See "Selling Yourself" in the May 1987 issue; the article lists typesetters around the country who accept both IBM and Macintosh disks.)*

Be sure that your disk will fit the drive of your clients' typesetting machines, since the older ones had 8-inch drives. Alternatively, with a modem and communications software you could transmit materials via telephone to the typesetting house.

There is no reason that you could not provide a typesetting service as well, but typesetting machines cost around $75,000!

Q: I have been weaving for a long time as a hobby, and now I think I could really make a business of selling my pillow covers, place mats, clothing, and other hand-loomed articles. My daughter has an Apple IIe. Would it be helpful in my new business?

—C. OWEN, *Columbus, Ohio*

A: The Apple could help not only with business procedures but also with design and production. Leonard D. Duboff's *Business Forms and Contracts (in Plain English) for Craftspeople* (Madrona Publishers, P.O. Box 22667, Seattle, WA 98122) will get you ready for business. You can type the routine forms into the Apple, filling out and printing them as needed. Of course you can use the computer also for your marketing, general correspondence, and accounting.

Do you hate to set up your loom? A variety of software is available for designing weaving patterns and generating drawdowns. See, for example, the article by Janet A. Hoskins *"Computers and Weavers: Software is Just Another Tool in the Designer's Hand"* in the February/March 1987 issue of *Threads*. (Look for it in shops that sell yarn.)Anyone who knits, quilts, stitches, or does any kind of textile design and has an Apple II, Commodore 64, IBM PC, Tandy, Atari, Macintosh, Franklin Ace 1000, or VIC 20 will find the article an excellent resource.■

PC'S LIMITED 286[12]

SUPER FAST AND A SUPER PRICE: A STAR FROM THE LONE-STAR STATE

BY HENRY F. BEECHHOLD

The PC's Limited 286[12] is among the best dollar values in the computer marketplace. Its value derives not merely from reasonable pricing (there are less expensive machines), but from the high quality, special features, and company support you get for your money. On a five-star scale, this computer rates no less than 4.5 stars—and probably more.

PC's Limited (officially, Dell Computer Corp.) is a manufacturer of MS-DOS computers (XT, AT, and "386" machines), which are designed and built smack-dab in the middle of Texas. Unheard of a few years ago, PC's Limited has become a well-respected brand name—even though its computers can be bought by phone and by mail, but aren't available at any retail outlet.

PC's Limited, based in Austin, is a direct-sales manufacturer that doesn't consider itself a mail-order house. Unlike mail-order houses, which sell various brands, PC's Limited makes and sells only its own brand and has a stake in providing strong customer service and technical support to strengthen its brand name.

You can order a PC's Limited computer in virtually any configuration. EGA monitors, 3.5-inch disk drives, and tape-backup devices are all readily available. Most models will be shipped to your home or office in one to two weeks (to order, call [800] 426-5150; [800] 252-8336 in Texas).

From the range of models available, we've chosen the PC's Limited 286[12] for review because it has been the company's best-seller over the past year. It's an IBM PC AT compatible (with 1MB of RAM and a floppy that stores 1.2MB) that's based on the Intel 80286 microprocessor. The 80286 is a more powerful chip than the Intel 8088 or 8086 used in most PC and XT compatibles. Our test unit also came with a 40MB hard-disk drive and a monochrome monitor. The 286[12] runs AT-specific as well as PC-XT software and accepts any expansion boards designed for IBM-style computers.

HENRY F. BEECHHOLD *reviewed the IBM Personal System/2 Model 30 in the July issue.*

SMARTVU

PC's Limited has not merely cloned the IBM AT, but it has created a unique machine. The most obvious difference between the PC's Limited 286[12] and other compatibles is the SmartVU panel, which contains a hard-drive busy light, a power-on light, and a four-character display. There's also a key switch that locks the keyboard; this is particularly handy when you have to interrupt your computing to tend to other work.

The SmartVU will display more than 10 error codes, including one for a low-energy clock/calendar battery. Since PC's Limited is intensely concerned with customer satisfaction, the company encourages you to call its toll-free technical-support hotline whenever a SmartVU error code appears. The company claims that 90 percent of the technical problems are solved over the telephone.

After bootup, SmartVU acts as a status indicator as well as an error monitor, reminding you of the computer's present clock speed, the active floppy drive, and so on.

Another distinctive feature of the PC's Limited computers is the built-in System Installation Menu, accessed either from DOS or from most applications programs by pressing the CTRL, ALT, and ENTER keys.

PC'S LIMITED 286[12] VERSUS IBM PC AT

	PC's Limited 286[12]	IBM PC AT*
List Price (For Listed Configuration)	$2,699, (ship. incl.)	$4,595
Microprocessor:	Intel 80286	Intel 80286
Standard RAM	1MB	512K
Disk Drives:	1 half-height 1.2MB floppy 40MB hard-disk drive	1 half-height 1.2MB floppy 30MB hard-disk drive
Expansion slots:	6 AT-style (16-bit) 2 XT-style (8 bit)	3 AT-style (16-bit) 5 XT-style (8-bit)
Speed:	6MHz or 12MHz	8MHz
Power supply:	192 watts	192 watts
Included Ports:	Serial, 2 parallel, joystick	Serial, parallel
Video Display:	Monochrome graphics, 12-inch monitor	Not standard
Other Features:	Math co-processor socket Real-time clock/calendar SmartVU Display System Built-in Configuration Menu	Built-in clock/calendar Switchable worldwide power supply Math co-processor socket

**Even though the IBM PC AT is out of production, it is the accepted standard for AT-compatible manufacturers.*

This menu offers six choices: Configure Hardware, Select Operation Characteristics, Park Fixed-Disk Heads, List SmartVU Diagnostic Summary, Resume Program, and Restart System. The first two selections offer their own submenus. Even though you won't be using this menu system often, it's a thoughtful addition to the computer that typifies the company's emphasis on the user.

BARNLIKE INTERIOR

PC's Limited computers come in two sizes: one approximately the size of a standard IBM PC XT, the other about 25 percent smaller. (Both cost the same.) The large-chassis computer that we tested can handle up to four standard drives internally—be they floppy, hard disk, or tape backup. The small-chassis version can handle three.

The inside of the computer is barnlike, with plenty of room for boards, drives, and tinkerer's hands. All the components look sturdy and carefully assembled. Our machine came with only two internal devices, so we couldn't push the machine's 192-watt power supply to its limits. But since the design leans to overbuilding rather than underbuilding, we're confident of its ability to perform well with a full complement of drives.

KEYBOARD AND MONITOR

The keyboard adheres to the older IBM PC layout, with 10 function keys arranged in a double column on the left. A status light panel on the upper right indicates when the CAPS LOCK, NUM LOCK, and SCROLL LOCK keys are in use. Although the keys lack the special touch of IBM's own, they're snappy enough to be comfortable for skilled keyboardists. The ENTER key is of the large, reverse "L" type, the most convenient of the IBM versions.

One more mark of the PC's Limited 286^{12} uniqueness is that the keyboard can be switched (via DIP switches) to work with either a PC XT-type or an AT-type computer. In addition, the location of the ESC and the tilde/left-hand apostrophe keys can be switched to suit you.

The Taxan 12-inch amber monitor (made in Korea) has a good reputation for reliability. (Sometimes, Samsung or other monitors are sold with the system.) The monographics display is sharp and pleasing to the eye. There is no blurring at the edges of the display and no distortion of any kind. The characters vanish instantly, with none of the smeary effect you get from long-persistence phosphors. The monitor's brightness and contrast can be adjusted over a wide range.

A SPEEDY PERFORMER

After unpacking, hooking up the computer was a simple matter of plugging in power, keyboard, and monitor cables. The computer is delivered without MS-DOS (you can purchase it if you wish), and the hard disk is unformatted.

To speed the rest of the setup procedure (as well as test the company's sincerity with respect to customer service), I called PC's Limited's toll-free phone number and was talked expeditiously through the special hard-disk formatting procedure. Since MS-DOS can't cope with a hard drive larger than 32MB, PC's Limited provides a piece of proprietary software to set up the 40MB hard disk as two disks. Within a short time, I had "split" the disk into two 20MB drives.

With MS-DOS 3.2 installed, I checked out the built-in menu system, exploring the various features and setting the computer to boot at a speed of 12MHz. Let me tell you, if you're used to a 4.77MHz computer (standard IBM PC speed), 12MHz will leave you breathless—at least for the first hour or so. After that, it'll seem normal and hardly noticeable. How quickly we become spoiled!

Just to remind myself of the "old days," I switched to the computer's 6MHz option from time to time. (Speed can be toggled on the fly simply by pressing the CTRL, ALT, and "backslash" (\) keys. The SmartVU display tells you which speed is current.)

The Owner's Manual, clearly written and adequately illustrated, warns you that at 12MHz there are some expansion cards that don't run well (or at all) and that some software copy-protection schemes become balky. If you run into such a problem, you need only "gear down." All of the software packages I tested—word processors, data managers, DOS shells, and miscellaneous utilities—worked flawlessly at warp speed.

Standard (360K) and high-density (1.2MB) floppy-disk formatting worked correctly, and I was able to read and use standard MS-DOS disks from several MS-DOS computers. Were I buying the machine, I would have it delivered with both a 5.25-inch and a 3.5-inch floppy installed. For little additional cost, you would have total MS-DOS disk-swapping compatibility.

General reliability is best determined by leaving the computer powered up for long periods. A two-day unbroken run (with monitor left on but screen blanked) resulted in no misbehavior. The computer fan (not the quietest) kept the machine's temperature at room level. With a full complement of boards and drives, it would undoubtedly run a bit warmer.

CUSTOMER SERVICE

Every sale, even those to overseas customers, goes directly through the company's Austin home office. This way, says PC's Limited, the customer is best served and receives at least a 30-percent price reduction over a storefront retailer.

On its 12-month limited warranty, PC's Limited asserts that "customer satisfaction is our primary goal—satisfaction not only with our products but with the service we give at the time it's [a purchase] made and afterwards." Supporting this claim is the full-cash refund ("30-day total-satisfaction guarantee") and toll-free numbers for both customer service and technical service. The company claims that only about 3 percent of its customers have requested their money back.

A special feature of the warranty is the free Honeywell-Bull service contract, which assures you no-cost on-site service if you live within 100 miles of an H-B outlet. If you prefer, you can return the computer directly to PC's Limited for service. The period of the repair-or-replace contract is one year. PC's Limited owners who bought machines without a service contract can add one for $35.

A HOME-BUSINESS MACHINE

Because of its speed and almost infinite adapability, the 286^{12} is ideally suited for business use—in a large, small, or home business. And though a computer of this power might ordinarily be considered a self-indulgence for the *casual* home user, its modest price makes it mighty attractive. For either market, the 286^{12} offers long-term protection against obsolescence, despite the presence of IBM's new Personal System/2 series. Writing this review on the PC'S Limited 286^{12} has destroyed any chance of my living happily with my old PC. ■

IBM's Personal System/2 Model 25

A NEW COMPUTER FOR HOME AND SCHOOL THAT'S EASY TO SET UP AND OCCUPIES LESS SPACE ON YOUR DESK

BY DAVID HALLERMAN

When IBM rolled out its Personal System/2 series of computers in early April, we noticed that something was missing. The line consisted of four models—the 30, 50, 60, and 80. "Where are the missing numbers?" we wondered. For instance, where is the Model 70? (Would it be a desktop version of the floor-standing Model 80?)

So in early August, a day after rival Tandy Corp. announced several new computers (*see last month's cover story*), it didn't come as a complete surprise when IBM unveiled a missing part of the puzzle—the Personal System/2 Model 25.

The Model 25 computer is—as the number seems to imply—a half step below the Model 30 (*see Hands-On Review of the Model 30 in the July 1987 issue*). A close relative of the Model 30, the Model 25 is the second computer in the PS/2 series that will not be able to run the forthcoming OS/2 operating system, although, like all the other PS/2 machines, it will run standard MS-DOS software.

IS IT LIKE A MACINTOSH?

The most striking aspect of the new computer is how little of your desktop it consumes. Much like Apple's Macintosh Plus and SE, the Model 25's CPU, disk drive(s), and monitor come in one unit with a detached keyboard. And it's as easy to set up as a Mac; just plug the keyboard into the main unit, plug that unit into the wall, and turn the computer on with a single switch. However, unlike the Macintosh, the IBM Model 25 offers a choice of monitors: either a 12-inch black-and-white monochrome or RGB color. The rock-steady video display is identical to the Model 30's, with a rich graphics mode of 256 colors out of a palette of more than 256,000 hues in 320 x 200 x 256 resolution, or two colors from the same palette when using the higher 640 x 480 resolution. Monochrome monitors offer their own sharp image with 64 shades of gray. You can choose a keyboard, too: either the new Space-Saving Keyboard that's minus the numeric pad or the standard PS/2 keyboard, the IBM Enhanced PC model, which is three inches longer and $45 extra.

DAVID HALLERMAN *is a senior editor for* FAMILY & HOME-OFFICE COMPUTING.

IBM's new PS/2 Model 25 is designed for everyone from young children who are using computers for the first time to professionals who bring work home from the office.

IBM PS/2 Model 25: The Specifics

OPERATING SYSTEM: IBM PC DOS 3.3
MICROPROCESSOR: Intel 8086
CLOCK SPEED (MHz): Eight
MEMORY: 512K standard, expandable to 640K ($49 option)
GRAPHICS DISPLAY: Up to 256 colors (from a palette of more than 256,000 colors) or 64 shades of gray; 320 x 200 x 256; 640 x 480 x 2
MONITOR: 12-inch (diagonally) monochrome or color, built-in
DISK DRIVES: one 720K internal 3.5-inch; optional second internal 3.5-inch drive is $170
KEYBOARD: Space-Saving Keyboard (no keypad), optional Enhanced Keyboard ($45)
EXPANSION SLOTS: Two (one full-size, one half-size)
PORTS: Serial and parallel; interchangeable ports for keyboard and optional mouse; audio
FOOTPRINT: 14.7-by-9.5 inches
POWER SYSTEM: On-off switch in front of machine; uses one power cable and one plug
WEIGHT: 28 lbs., monochrome; 37 lbs., color
DIMENSIONS: 15" H x 12.6" W x 14.7" D
OPTIONAL COLLEGIATE KIT: Contains Personal System/2 Mouse and software: IBM PC DOS 3.3, a tutorial diskette, four blank 3.5-inch disks, installation guide, two preconfigured disks containing required functions of DOS 3.3 and *Microsoft Windows*, *Windows Write*, *Windows Paint*, and *Windows Cardfile* ($314)
WARRANTY: One year
LIST PRICE: $1,350 (monochrome display and one 3.5-inch drive); $1,695 (color display and one 3.5-inch drive); $1,520 (monochrome display and two 3.5-inch drives); $1,865 (color display and two 3.5-inch drives); $1,883 (Model 25 Collegiate: monochrome display, two drives, 640K of memory, and Collegiate Kit); $2,228 (Model 25 Collegiate: color display, two drives, 640K of memory, and Collegiate Kit)

MODEL 25 FEATURES

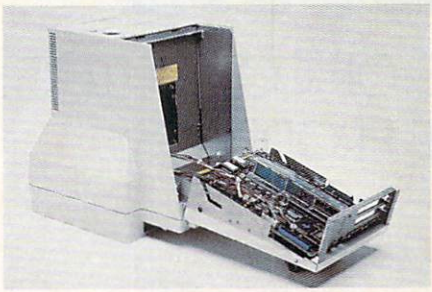
Included are serial and parallel ports, two interchangeable ports for the keyboard and an optional mouse, and a welcome audio connector for attaching your computer to external speakers, amplifiers, or headphones. The Model 25's Intel 8086 microprocessor runs at 8MHz, with a full 16-bit wide data path between memory and microprocessor. These two features give the Model 25, as well as the Model 30, an effective running speed more than twice as fast as the speed of the original IBM PC. To allow for that desk-saving small footprint, something had to be sacrificed—and it was the slots. In contrast to the Model 30, with its three full-size XT-compatible slots, the Model 25 offers only two expansion slots, one full-size and one half-size.

IBM introduced two versions of the Model 25. The basic model comes with one 720K 3.5-inch floppy drive, 512K of memory, a keyboard, and your choice of monitor; color retails for $1,695, monochrome for $1,350. Expansion to 640K and a second floppy drive are optional (at $49 and $170, respectively), and IBM PC-DOS 3.3 is a separate purchase ($120).

If you're looking at the Model 25 for work or higher education, you'll probably want to add the second drive and extra memory. In fact, you might want to consider the other version of the Model 25, the Collegiate. Not just for those in college, the

Model 25 Collegiate bundles several options that many people want, along with a few extras that help to make it ready-to-go. Included are two 720K 3.5-inch floppy drives, a full 640K, and the IBM PS/2 Collegiate Kit. The kit (also available separately for $314) contains an IBM mouse and *Microsoft Windows*, the icon-based, point-and-choose system that gives you a Macintosh-like interface. Also in the kit (and, again, similar to the original Macintosh) are a word processor and a paint program, *Windows Write* and *Windows Paint*. Other kit extras include PC-DOS 3.3 (which you'd have to buy anyway), an interactive disk tutorial for the entire Collegiate Kit, four blank 3.5-inch disks, and—to help you get started—two preconfigured disks that contain the necessary functions of both DOS 3.3 and *Microsoft Windows*. At the introduction of the computer, Bill Lowe, IBM vice president and president of the Entry Systems Division, pointed out that the Collegiate Kit is "customized . . . to improve performance and to make [the Model 25] easy to use."

IBM executives emphasized their desire for a larger share of the education market. They've provided special pricing for the education community



If you want to slip an add-on board into one of the Model 25's slots, unplug the computer, lay it down on its face, remove the two screws, and lift off its cover.

(about a 40-percent discount for grades K-12) and have sales reps on college campuses. If you can obtain a discounted educational package, the $1,695 color system costs a little more than $1,000. However, at almost $1,749 retail for a single-drive, 640K color system, the Model 25 can be bested for value by computers such as Tandy's new 1000 HX ($1,209 for a comparable system).

WHO MIGHT WANT THE 25?

IBM sees the Model 25 Collegiate as a perfect choice not only for college students, but also for anyone associated with a college. At the launch, Victor J. Goldberg, an IBM vice president in the Information Systems Group, commented, "The Model 25 Collegiate is a great system for college students, faculty, and staff who want computers for use at home, in the lab, or in the dorm for analysis, research, studying, or simply doing homework."

And for younger students, Goldberg said, "[The Model 25 is] designed for safety and convenience, with one power cord and a stabilizing bar for securing it to a desk. And it has a sturdiness that's almost kid-proof."

IBM executives also presented the Model 25 as a machine to help people work at home. With its small base, it's easy to see the Model 25 as a sensible choice not only for a typically small dorm room, but also for work in homes where space may be at a premium. If you use an MS-DOS computer at your job and sometimes take work home, the Model 25 could be a good choice, particularly if your PC at the office already accepts 3.5-inch disks.

But people looking for a primary computer for a small business or home office should consider their needs carefully before investing because, at this point, the Model 25, unlike all other PS/2 computers, offers no hard-disk drive option. ■

SIDE-BY-SIDE COMPARISONS:

Amstrad, Macintosh, Apple IIGS, Tandy 1000 HX, Model 30, and Model 25

	Amstrad PC 1512**	Apple Macintosh Plus*	Apple IIGS*	Tandy 1000 HX**	PS/2 Model 30	PS/2 Model 25
List price	$799	$2,199	$1,398	$699	$1,695	$1,350
Warranty	one year	90 days	90 days	90 days	one year	one year
Microprocessor	8086	68000	65C816	8088-2	8086	8086
Disk drive(s) included	one 360K 5.25-inch drive	one 800K 3.5-inch drive	one 800K 3.5-inch drive	one 720K 3.5-inch drive	two 720K 3.5-inch drives	one 720K 3.5-inch drive
Monitor	monochrome included; color is optional	monochrome included; no color available	none included; monochrome and color are optional	none included; monochrome and color are optional	none included; monochrome and color are optional	monochrome included; color is optional
Other hardware included	mouse, built-in clock/calendar	mouse, built-in clock/calendar	mouse, built-in clock/calendar	built-in clock/calendar	built-in clock/calendar	none
Memory	512K, expandable to 640K	1MB, expandable to 4MB	256K, expandable to 8MB	256K, expandable to 640K	640K	512K, expandable to 640K
Expansion slots	three	none	eight	one slot accepts three "PLUS" expansion boards	three	two
Ports included	serial, parallel, mouse, joystick	two serial, disk drive, SCSI, mouse Apple Talk local-area network, audio	two serial, disk drive, AppleTalk local-area network, keyboard/mouse/joystick, audio	parallel, two joystick, disk drive, audio	serial, parallel, mouse	parallel, serial, keyboard, mouse, audio
Graphics display	up to 16 colors	black and white only	256 colors at one time (out of a palette of 4,096 colors)	up to 16 colors	up to 256 colors (from a palette of over 256,000 colors) or 64 shades of gray	up to 256 colors (from a palette of over 256,000 colors) or 64 shades of gray
Software included	MS-DOS 3.2, DOS Plus, Locomotive's GEM BASIC 2, GEM *Desktop*, GEM *Paint*, GEM *Doodle*	*Finder*, *HyperCard*, disk accessories, utilities	ProDOS, BASIC	BASIC, MS-DOS 2.11 (in ROM), *Personal Deskmate 2*	start-up disk	start-up disk

*Not PC-DOS or MS-DOS compatible. ** Other models are also available.

NEW PRODUCTS

ANNOUNCEMENTS OF COMPUTERS, PERIPHERALS, AND HOME-OFFICE PRODUCTS

IBM's newest laptop, the IBM PC Convertible Model 3, has a new screen and power supply.

COMPUTERS & PERIPHERALS

IBM PC Convertible Model 3

MANUFACTURER: IBM Corp.
ADDRESS: 900 King St., Rye Brook, NY 10573; (800) 447-4700
PRICE: $1,695

IBM has introduced a new model of its 12-pound PC Convertible laptop computer. The Model 3 includes a backlit, supertwist liquid crystal display (LCD)—for improved readability—and a new power supply. The power supply lets users operate the new LCD for up to four hours before recharging is necessary.

Owners of older models of the PC Convertible can purchase a $350 upgrade kit consisting of the new display and power supply.

IBM also announced a price reduction on the PC Convertible Model 2: from $1,695 to $1,395.

The IBM PC Convertible measures 14.7-by-12.3-by-2.7 inches and uses 3.5-inch disk technology. The computer comes with 256K of memory, expandable to 640K, and features a special "power-on and resume" function.

This feature allows you to turn off the portable while you're working on an application and then resume the same work when you turn the computer back on.

—BERNADETTE GREY

CIRCLE READER SERVICE 52

Hayes V-Series Modems

MANUFACTURER: Hayes Microcomputer Products, Inc.
ADDRESS: P.O. Box 105203, Atlanta, GA 30348; (404) 449-8791
PRICES: V-series Smartmodem 9600, $1,299; V-series Smartmodem 9600B, $1,199 and $1,299 (bundled with *Smartcom III*); V-series Smartmodem 2400, $899; and V-series Smartmodem 2400B, $849 and $899 (bundled with *Smartcom III*); V-series Modem Enhancer, $349; *Smartcom III*, $249.

It seems like every time we're in the market for a new car, a bike, or a pair of sneakers, we hear about a top-of-the-line product that uses the latest technology to make us faster—for a price. Engines can turn faster, wheels can roll faster, even feet can move faster.

Just as technology speeds the transportation of human beings, it accelerates the transportation of electronic information. Take a look at the advances in Hayes Microcomputer Products's line of modems: In 1981, the company introduced its Smartmodem 300, which could transfer data at a rate of 300 bits per second, or 300 baud. That wasn't fast enough for most of us. The next year, the company began selling a 1,200-bps modem that was four times as fast. That kept us happy for a while, all right. But once 2,400-bps—and yes, even 9,600-bps—modems started rolling in, some information movers began comparing 1,200-bps modems to donkey-drawn carts.

And now Hayes wants us to take a spin with four new modems, dubbed the V-series, which incorporate the company's new high-speed technology. The V-series Smartmodem 9600 (external) and V-series Smartmodem 9600B (internal) are 9600-bps modems that can compress data so that information is actually moving at up to 19,200 bps. The V-series Smartmodem 2400 and Smartmodem 2400B can also send information up to two times as fast as Hayes's older 2,400-bps modems.

The modems include new error-control features, they're resistant to noise on the phone lines, and they support international standards.

GET THE KNOW-HOW TO SERVICE EVERY COMPUTER ON THIS PAGE.

Learn the Basics the NRI Way—and Earn Good Money Troubleshooting Any Brand of Computer

The biggest growth in jobs between now and 1995, according to Department of Labor estimates, will occur in the computer service and repair business, where demand for trained technicians will actually *double.*

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AND MORE!

It all adds up to confidence-building, real-world experience that includes training in programming, circuit design, and peripheral maintenance. You'll be learning about, working with, servicing, and troubleshooting an entire computer system—monitor, keyboard, computer, disk drive, power supply—to ensure that you have all the essential skills you need to succeed as a professional computer service technician.

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Send the postage-paid reply card today for NRI's big, 100-page, color catalog on NRI's electronics training, which gives you all the facts about NRI courses in Microcomputers, Robotics, Data Communications, TV/Audio/Video Servicing, and other growing high-tech career fields. If the reply card is missing, write to the address below.

Your NRI total systems training includes: • NRI Discovery Lab® to design and modify circuits • Your four-function digital multimeter with walk-you-through instructions on audio tape • Digital logic probe for visual examination of keyboard circuits • The newest Sanyo 880 Series Computer with "intelligent" keyboard and 360K double-density, double-sided disk drive • High resolution monochrome monitor • 8K ROM, 256K RAM • Bundled software including GW BASIC, MS-DOS, WordStar, CalcStar • Reference manuals, schematics, and bite-sized lessons.

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We'll Give You Tomorrow.

Hayes also says the modems have "automatic feature negotiation" capabilities, that is, they are able to analyze all options (including speed) available for the connection and then select the most efficient combination.

Drawbacks and Enhancements

Unfortunately, if you're using a V-series Smartmodem 9600, you can't transmit files at top speed unless there's another V-series Smartmodem 9600 to receive the information. To transmit to or receive from a slower modem, you would have to change your transmission rate to, let's say, 1,200 or 2,400 bps.

For those people without V-series modems, Hayes announced the V-series Modem Enhancer, an add-on board that will provide the installed base of Hayes external-modem users with the V-series system technology. The V-series Modem Enhancer will be offered at a special introductory price of $199 until September 30, 1987. Following this introductory promotion, the estimated retail price will be $349.

For home-office workers who must exchange large amounts of data with their corporate offices, business associates, and clients, these new modems and the modem enhancer will allow information to travel back and forth faster than ever before. And while the modems are pricey, the time they save translates into dollars saved.

New Communications Software

Hayes also introduced *Smartcom III*, new communications software for the IBM PC and compatibles. The program meets the needs of a complete range of users better than its predecessors because it lets beginners use menus, while more experienced users can take shortcuts and use command-level operations. *Smartcom III* requires MS-DOS (2.0 to 3.3) and a minimum of 512K of memory and a hard-disk drive. It comes with copies of the program on both 5.25- and 3.5-inch disks. An upgrade from *Smartcom II* to *Smartcom III*, on both disk formats, costs between $30 and $75, depending on the purchase date of *II*. And until December 31, 1987, owners of *Crosstalk* (Crosstalk Communications) can trade in their used diskettes for *Smartcom III* for $60.

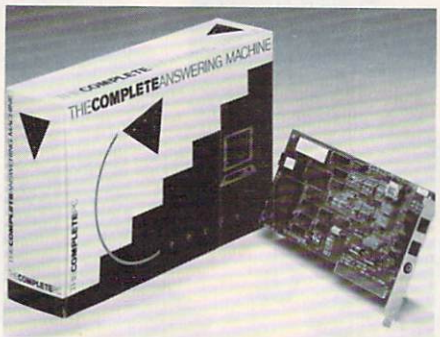
—BERNADETTE GREY

EDITOR'S NOTE: *In conjunction with the introduction of its new V-series system products, Hayes has reduced estimated retail prices by as much as 33 percent on its current modem product line. For instance, the Smartmodem 1200 now carries an estimated retail price of $399, instead of $599, and the estimated retail price of the Smartmodem 2400 has dropped from $899 to $599.*

CIRCLE READER SERVICE 53

The Complete Answering Machine

MANUFACTURER: The Complete PC, Inc.
ADDRESS: 521 Cottonwood Drive, Milpitas, CA 95035; (408) 434-0145
PRICE: $349
HARDWARE COMPATIBILITY: IBM PC and compatibles



The Complete Answering Machine adds advanced answering machine capabilities to IBM PCs and compatibles.

For some major companies, such as IBM Corp. and Time Inc., voice messaging has become the communications center of the eighties. Now there's a voice-messaging add-on board that can give a one-person office the sound of a big-time conglomerate.

The Complete PC has released its first product, The Complete Answering Machine (CAM), for the IBM PC and compatibles. CAM can digitize your callers' voices and store them on your computer's hard disk. The product gives its owners and users a multitude of phone options, including basic telephone answering machine tasks and personal voice mail.

With CAM, each person in your office or family can have a private voice mailbox for confidential messages, which can be accessed only by entering a special password. CAM can also forward urgent messages if you leave a number. You can pick up your messages and change your greeting or almost any CAM parameter from your own phone or any Touch-Tone phone.

Choose from a library of greetings to play back to your callers. (CAM also provides a professionally recorded greeting if you don't want to create your own greetings and messages.) Callers who are familiar with your voice-messaging system can override the verbal prompts and immediately begin recording.

For folks too busy to make routine calls, CAM offers secretarial assistance: It will deliver messages to a list of recipients, noting the date and time of release and provide a return receipt or request a recorded message.

The CAM operates concurrently with most PC applications. This means that, using CAM, your computer can perform all these voice-messaging functions while you're working on something else.

—ANDREW TORRES

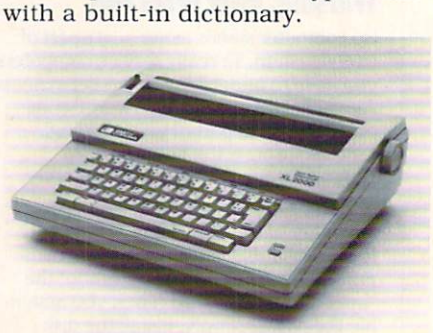
CIRCLE READER SERVICE 54

HOME-OFFICE PRODUCTS

XL 2000 Electronic Typewriter

MANUFACTURER: Smith Corona
ADDRESS: 65 Locust Avenue, New Canaan, CT 06840; (203) 972-1471
PRICE: $269

Smith Corona, long known for its line of typewriters, has introduced a new portable electronic typewriter with a spelling-checker, word-mistake finder, and one-touch word eraser. At $269, it's Smith Corona's least expensive electronic typewriter with a built-in dictionary.



The $269 XL 2000 is Smith Corona's least expensive electronic typewriter equipped with a built-in dictionary.

In a small office—with two or three people and just one computer—the XL 2000 can serve as the main typing tool for administrative work: A typewriter used strictly for

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ADAM COMPUTER

(Less printer)
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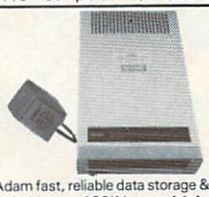
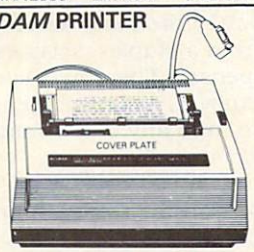
Item #7410 Complete – **$99.00**

ADAM 5¼" DISK DRIVE



Gives your Adam fast, reliable data storage & retrieval. Can hold up to 160K bytes of information. Uses industry-standard SS/DD disks. Connects directly to your Adam memory console. Comes w/disk drive power supply, Disk Manager disk and owner's manual.
Mfr – Coleco, model 7817
Item #12830 *Like New* – **$199.00**

ADAM PRINTER



Complete, less top cover plate. Friction feed. Takes standard paper 8½" x 11". (Customer returns; tested – operational.)
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Item #6643 **$19.95**

Adam Link Modem –
(Software included.)
Item #12358 **$29.95**

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Adam Cassettes –
(Consisting of Smart Basic, Buck Rogers & blank cassette.) Item #7786
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PC 8300 HOME COMPUTER
(Advanced version of the Timex 1000)

42-key mechanical keyboard (not membrane). Contains 2K of RAM. Reverse video, Z80A, 6.5MHz processor, ROM 8K BASIC. Graphics capability/sound-music, TV or monitor. Joystick input operates on 115 VAC. Includes: AC adapter, TV cable, and pair of cassette cables. Will run all prerecorded tapes for Sinclair/Timex 1000-ZX81. Mfr – Power 3000. In orig. boxes.
Item #10336 **$29.95** New

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★ **16K RAMPACK upgrade**
Item #10337 **$9.95** New

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Item #12147 **$19.95** New

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Mfr – Panasonic #JU-475
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Tandon TM55-4 DS/Quad
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2 for **$150.00**

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Double sided/double density, full height drive. 48 T.P.I., 80 tracks.
Mfr – Tandon TM100-2
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96 TPI, DS/Quad Density
Mfr – CDC #9409T
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15" COMPOSITE VIDEO MONITOR

15", green phosphor, high resolution (12 lines center) and bandwidth from 10Hz to 30Hz ± 3dB. Operating volt.: 120/240VAC, 50/60Hz., 65VA max.
Mfr – Motorola – Alpha Series
Item #10044 **$34.95** New

12 VDC MINI BOXER® FANS

40 CFM, ball bearing, .3 amps. Dim.: 1" thin x 3⅜" square
Mfr – IMC #3610-LB012
Item #13598 **$12.95**

COMPUTER GRADE POWER SUPPLY

Other uses–runs CB & car radios. Comes ready to plug in!
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+5V @ 3 amp.
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Item #9501 **$24.95** New

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DC Output: +5V @ 8 amps.
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Dim.: 12"L x 3¾"H x 5¾"D
Encl. in aluminum housing. Fan cooled. Mfr – Shindenger Electric #130569SXD
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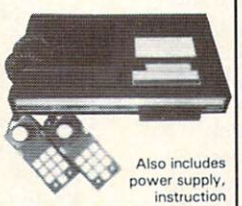

Also includes power supply, instruction manual, modulator, and one Donkey Kong cartridge.
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Includes ***SLITHER*** cartridge.
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Includes ***BASEBALL*** cartridge.
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Mfr – Capetronic #DS-1030;
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C-64
Consists of 12 asstd. cartridges. Includes: ***Number Nabber, Star Post, Financial Advisor, Radar Rat, Jupiter Land, Magic Compos, Viduzzles, Golf, Easy Calc, Simon Basic, Dragon's Den,*** & ***ABC Voice.*** Set of 12.
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CIRCLE READER SERVICE 3

typing will free up the computer for other projects. And if you don't have a letter-quality printer, the XL 2000 can create professional-looking correspondence, when dot-matrix printouts just won't do.

The XL 2000's built-in, 50,000 word Spell-Right Electronic Dictionary detects typographical errors and misspellings and also catches repeated words (*the the*, for example) and capitalization errors at the beginning of sentences. WordFind points out misspellings and typos anywhere on a line, and WordEraser Correction erases up to a full line.

Other features include auto half-space, end-of-page warning, auto return, auto center, 10- and 12-pitch modes, bold print, auto superscript and subscript, and keys for foreign language characters and symbols.

—LISA WU

CIRCLE READER SERVICE 55

UX-80 Copier/Fax

MANUFACTURER: Sharp Electronics
ADDRESS: Sharp Plaza, Mahwah, NJ 07430; (201) 529-8200
PRICE: $1,499

This Sharp product combines a copier that makes reductions and enlargements and a facsimile machine that will transfer one-page documents in 40 seconds.

For the last quarter of a century, many American families have been entertained and informed by electronic products from Sharp Electronics, a U.S subsidiary of Japan's $6.8 billion Sharp Corporation. Now some of these same people are turning off their televisions and stereos, setting up home offices, and putting Sharp products to work.

Sharp Electronics is paying attention to figures that indicate that up to 20 million Americans have in-home offices. This year, the company launched into the home-office market with a line of compact and inexpensive copiers that eliminate frequent trips to photocopy machines at local libraries or copy shops.

And recently, the electronics manufacturer announced a product that combines a personal copier with another office product that has been welcomed into many homes: the facsimile machine.

The UX-80 copier/fax is a 22-pound machine that measures approximately 14-by-6-by-16 inches (roughly the same size as a laptop computer). The unit includes a copier that offers reduction and enlargement and makes 8½-by-11-inch or 8½-by-5½-inch copies. It prints at a speed of 30 seconds per copy. The facsimile unit has a built-in telephone handset and transmits a one-page document in 40 seconds.

—BERNADETTE GREY

CIRCLE READER SERVICE 56

Minimate 6750

MANUFACTURER: PhoneMate Inc.
ADDRESS: 325 Maple Avenue, Torrance, CA 90503; (213) 618-9910
PRICE: $220

For those who work best in a neat, clutterfree environment, PhoneMate has integrated a telephone, an answering machine, and an AM/FM digital clock-radio into one space-saving unit.

The Minimate 6750 includes a beeperless remote answering machine that plays, saves, and replays messages remotely using a Touch-Tone phone and an access code. As with many other answering machines, call-screening and ring-select are standard. In addition, a privacy-mode will silence the telephone ringer but leave the answering machine on to record messages.

Minimate also has a personal memo feature that allows you to leave a message without using the phone. The message can then be retrieved through the machine or by phone.

The Minimate 6750 is a combined Touch-Tone phone, beeperless answering machine, and AM/FM digital clock-radio.

Store frequently called numbers on the unit's two-touch dialing option. And between calls, you can listen to your favorite radio station in your office. If the phone should ring, the radio will mute itself when you pick up the receiver.

—ANDREW TORRES

CIRCLE READER SERVICE 57

Factory: For Nondesk Workers

MANUFACTURER: PLUS USA Corporation
ADDRESS: 10 Reuten Drive, Closter, NJ 07624; (201) 767-6950; or 17980 S. Savarona Way, Carson, CA 90749; (213) 321-9419
PRICE: $33

What is this? It's not a Swiss army knife. It's a stapler. It's a hole punch. It's Factory.

No matter what kind of office you work in, you're probably never too far away from a stapler, scissors, or a tape dispenser. There may even be a staple remover, a carton opener, a hole punch, and any of a number of other gadgets nearby.

But what can you use if you're on the road or working from a home office and you need a stapler or a hole punch? Your handy Swiss army knife can't help you out here. But Factory can. Molded in the shape of a Swiss army knife, Factory rolls nine office tools into one smartly designed accoutrement that fits in your palm: It includes a tape measure, scissors, a tape holder, a hole punch, a stapler and staple remover, a magnifying lens, a carton opener, and a small storage department.

Factory comes in red, blue, black, or white, can easily fit into a small drawer or pocket, and has a D-ring that will attach to a wall hook or key holder. ■

—BERNADETTE GREY

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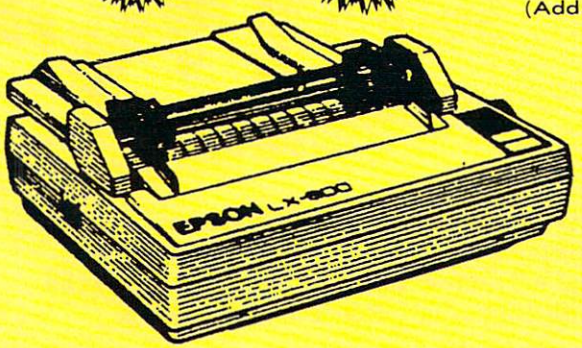

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SOFTWARE GUIDE

Welcome to FAMILY & HOME-OFFICE COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy, and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Programs have been evaluated and rated for their performance in each of the categories listed below. More detailed reviews follow the chart. Unless otherwise noted, all programs are in disk format, and minimum memory requirements are 48K for Apple II series, 48K for Atari, 128K for IBM PC/PC*jr* or compatibles, and 128K for Macintosh. "Atari" alone denotes the 800/XL/XE series. "C 64/128" means the software will run on both a C 64 and a C 128 computer in C-64 mode; "C 128" alone means the software will run only on that machine.

Here's a rundown of the rating categories and what they mean: **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **PS** = Play system (in the games reviews), the quality of the game design and the game's playability. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

HOME BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	EH	GQ	EU	V
AUTOMAC II Genesis Micro Software 106-147th Ave., SE Bellevue, WA 98007 (206) 747-8512 $50 ©1985, 1986	A perfect introduction to the joy of macros—a group of commands rolled into one. Here, you invoke a command by pressing OPTION along with the key you've chosen to represent that group. —AKER	512K Macintosh.	30-day warranty and money-back guarantee. Not copy-protected.	★ ★ ★	★ ★	★ ★ ★	N/A	E	★ ★ ★
CALENDARMAKER CE Sofware 801-73rd St. Des Moines, IA 50312 (515) 224-1995 $40 ©1986, 1987	Create a calendar for any month or year. Details abound, including three calendar styles, pictures for each month or day, and up to 255 characters per day. Good for business or home. —HALLERMAN	512K Macintosh. Printer.	90-day warranty. Not copy-protected.	★ ★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★ ★
ELECTRIC PENCIL PC Electric Software Corp. 9230 Markville Drive Dallas, TX 75243 (214) 234-8466 $50 ©1986	Totally revised version of the "very first word processor" available for microcomputers. Many special features, including six windows for documents and two supplied spelling checkers.† —MORRIS	256K IBM PC.*	30-day warranty. $10 thereafter. Not copy-protected.	★ ★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★ ★
FIRST DRAFT Scholastic Software 730 Broadway New York, NY 10003 (212) 505-3000 $70 ©1986	Sophisticated outlining tool to help anyone organize ideas for reports, articles, memos, and presentations. You do the thinking; it does the numbering and the arranging.† —SOLOMON	Reviewed on 64K Apple. Also for IBM PC.* 2nd drive, printer optional.	60-day warranty. $10 for 10 months thereafter or for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★	N/A	E	★ ★ ★
NOTES 'N' FILES DataPak Software, Inc. 14011 Ventura Blvd., #507 Sherman Oaks, CA 91423 (818) 905-6419 $130 ©1987	A dual word processor and database that works like a filing cabinet. Allows you to store data files and documents together according to subject. Uses a graphic interface. —FRANK	512K Apple IIGs. 3.5-inch drive required. 2nd drive recommended.	90-day warranty. Free backup when warranty card returned.	★ ★ ★	★ ★	★	★ ★ ★	E	★ ★
PUBLISHING PARTNER SoftLogik Corp. 11137 S. Town Square St. Louis, MO 63123 (314) 894-8608 $150 ©1986	There are so many features in this desktop-publishing program (different fonts, manual kerning, paint-file compatibility, etc.) that I get excited every time I use it. Supports laser printers.— BRADLEY	Atari ST. TOS in ROM. Monochrome monitor recommended.	30-day warranty. Not copy-protected.	★ ★ ★	★ ★ ★ ★	★ ★	N/A	A	★ ★ ★

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error-handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

*Titles listed for the IBM PC/PC*jr* will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

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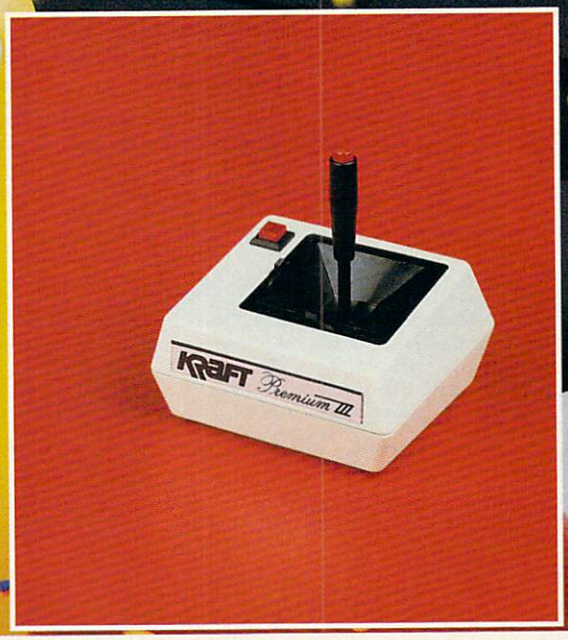

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HOME BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	EH	GQ	EU	V
READY! Living Videotext 117 Easy St. Mountain View, CA 94043 (415) 964-6300 $100 ©1985	Keep facts at your fingertips or structure your thoughts by using this memory-resident outliner with your word processor, spreadsheet, or other applications. Has a nimble search function and dials the phone, too.† —MORGENSTERN	256K IBM PC.* 512K recommended.	90-day warranty. $25 for 1 year thereafter. Not copy-protected.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★	N/A	A	★ ★ ★
SIGN DESIGNER Channelmark Corp. 2929 Campus Drive San Mateo, CA 94403 (415) 345-5900 $50 ©1984	Prints extremely readable banners up to 62 feet long in letters up to eight inches high. But no graphics on banners and it's much harder to use than *The Print Shop* or *Print Master*. — SUMMERS	Reviewed on IBM PC.* Also for Apple IIe/IIc/IIGS (80-column card required).	1-year warranty. $5 thereafter. Not copy-protected.	★	★ ★ ★	★ ★ ★	★	E	★

EDUCATION & CREATIVITY

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	EH	GQ	EU	V
THE AMERICAN INVESTOR Blue Chip Software 185 Berry St. San Francisco, CA 94107 (415) 546-1866 $150 ©1987	Realistic simulation of trading on the American Stock Exchange over a 9-month period. Emphasis on technical analysis and buying or selling options. For those serious about investing.† —MORRIS	512K IBM PC.* 2nd drive, color graphics (CGA) or Hercules graphics adapter, DOS 3.0 or higher.	90-day warranty. $12 thereafter or for backup. Not copy-protected.	★ ★ ★ ★	★ ★	★ ★ ★	★ ★ ★ ★	D	★ ★ ★
AUTHOR! AUTHOR! MindPlay 100 Conifer Hill Dr. Danvers, MA 01923 (800) 221-7911 $60 ©1987	Playwriting tool that prompts you with questions to create the outline, script, scenes, and playbill, and then displays the final production on-screen with graphic characters.† —SOLOMON	Apple. 64K, color monitor, 2nd drive recommended.	Unlimited warranty. Backup included; $10 for backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
DECIMAL DISCOVERY DLM One DLM Park Allen, TX 75002 (214) 248-6300 $46 ©1987	Encourages youngsters (ages 10+) to improve math skills by competing against themselves and each other, tracking their progress, and targeting their weak areas. More fun than flash cards. —ELTGROTH	64K Apple. Color monitor recommended.	6-month warranty. $15 thereafter or for backup.	★ ★ ★	★ ★ ★ ★	★ ★	★ ★	E	★ ★
THE NEW ALADDIN Disk Publications Inc. 12200 Park Central Dr. Dallas, TX 75251 (214) 788-4441 $20 each; $80 per year (6 issues) ©1987	The glossiest on-disk magazine we've seen with sophisticated sound and gorgeous graphics. Unfortunately, it's too much like a magazine, with more articles than interactive educational games or programming ideas. — SUMMERS	Reviewed on 512K Amiga. Also for Atari, Atari ST. Color monitor recommended. 2nd drive optional.	Unlimited warranty.	★ ★	★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	E	★ ★
ROSIE, THE COUNTING RABBIT D.C. Heath & Co./ Collamore Educational Publishing 125 Spring St. Lexington, MA 02173 (617) 862-6650 $66 ©1987	Children (ages 6–9) first read a colorfully illustrated story (on disk or in a book). Then they can rearrange the story's elements by changing characters, background, and text—or they can create their own stories. Confusing documentation detracts from the fun. —KOVACS	128K Apple IIe/IIc/IIGS. Color monitor, joystick, mouse, or KoalaPad recommended. Printer optional.	30-day warranty. $8 for 2 years thereafter. Backup included.	★ ★	○	★ ★	★ ★ ★ ★	A	★
THE SPY'S ADVENTURES IN NORTH AMERICA Polarware 1055 Paramount Parkway Batavia, IL 60510 (312) 232-1984 $18–$20 ©1986	Search the vast terrain of North America to ferret out the evil international smuggler and terrorist known as Dr. X. Works like a game, yet it's a social studies and geography lesson, too. Great graphics, but only a so-so game. —SOLOMON	Reviewed on 64K Apple. Also for C 64/128, IBM PC.* Color monitor recommended.	60-day warranty. $5 thereafter or for backup.	★ ★	★ ★	★ ★ ★	★ ★ ★ ★	A	★ ★ ★

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error-handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

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ENTERTAINMENT

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	PS	GQ	EU	V
BLUE POWDER GREY SMOKE Gardé 8 Bishop Lane Madison, CT 06443 (203) 245-9089 $50 ©1986	Recreations of three Civil War battles: Antietam, Gettysburg, and Chickamauga. With a helpful built-in tutorial mode and a quick-playing, joystick menu system. First rate. —DELSON	Reviewed on 64K Apple, C 64/128. Joystick (C 64/128 only).	90-day warranty. $5 thereafter.	★★★	★★★★	★★★	★★★	D	★★★
DARKHORN Avalon Hill Game Company 4517 Harford Road Baltimore, MD 21214 (301) 254-9200 $30 ©1987	A fantasy war game with a unique touch—even though four people can play, there are no official "turns." Instead, each player must be alert to what rivals are up to at the same time. Weak graphics. —DELSON	Reviewed on C 64/128. Also for Apple. Joystick optional.	30-day warranty. $10 thereafter or for backup.	★★	★★	★★★	★	A	★★
EARL WEAVER BASEBALL Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 $50 ©1987	Merges detailed graphics with a wealth of player statistics to come up with the best baseball game yet. Developed with the help of Earl Weaver, longtime manager of the Orioles.† —LANGENDOEN	512K Amiga. Joystick or mouse.	90-day warranty. $7.50 thereafter.	★★★★	★★★★	★★★★	★★★★	A	★★★★
EOS: EARTH ORBIT STATIONS Electronic Arts (see above for address and phone) $30–$35 ©1984–1987	Build and operate up to 32 space stations, each designed to serve humankind as a high-tech research platform, or as a profit-making venture, or both. Imaginative and ideal for groups.† —DELSON	Reviewed on 64K Apple. Also for C 64/128. Joystick.	90-day warranty. $7.50 thereafter.	★★★★	★★★	★★★★	★★	A	★★★★
LEGACY OF THE ANCIENTS Electronic Arts (see above for address and phone) $30 ©1987	Role-playing for one, as you use a joystick to transport your hero to strange places. Limited magic spells and few choices in the combat system. —DELSON	Reviewed on C 64/128. Planned for 64K Apple. Joystick.	90-day warranty. $7.50 thereafter.	★★	★	★★	★★★	A	★★
NFL CHALLENGE XOR Corporation 5421 Opportunity Court Minnetonka, MN 55343 (612) 938-0005 $100 ©1986, 1987	You're the coach choosing from dozens of plays on both offense and defense. Accurate football details make this a learning experience as well as a game. Great documentation. —HALLERMAN	Reviewed on 512K Macintosh. Also for 256K IBM PC.*	1-year warranty. Not copy-protected.	★★★	★★★★	★★★★	★★	E	★
REBEL CHARGE AT CHICKAMAUGA Strategic Simulations, Inc. 1046 N. Rengstorff Ave. Mountain View, CA 94043 (415) 964-1353 $50 ©1987	By using SSI's flexible Civil War play system, this simulation of the last major Confederate offensive offers superb war-gaming. Complex, though, so best for experts. —DELSON	Reviewed on 64K Apple, C 64/128. Also for Atari, IBM PC.*	30-day warranty. $10 thereafter. $12 for backup. Not copy-protected (IBM only).	★★★★	★★★★	★★★★	★★	D	★★★★
SUPERSTAR ICE HOCKEY Mindscape, Inc. 3444 Dundee Road Northbrook, IL 60062 (312) 480-7667 $35–$40 ©1987	Say hello to the best computer hockey game yet, as you control either the goalie, the center, or both. Or simply coach and set up strategic moves. Nonstop winning action.† —DELSON	Reviewed on C 64/128. Also for IBM PC.* Joystick (optional IBM).	90-day warranty. $13 thereafter or for backup.	★★★★	★★★★	★★★★	★★★	A	★★★★
UCHI MATA Mindscape, Inc. (see above for address and phone) $30 ©1986	More complex and subtle challenges mark the difference between this judo game and all the karate programs on the market. Scoring reflects the quality of each throw. —MORGENSTERN	C 64/128. Joystick.	90-day warranty. $13 thereafter or for backup.	★★★	★★★	★★★★	★★	A	★★★
UP PERISCOPE ActionSoft Corp. 201 W. Springfield Ave. Champaign, IL 61820 (217) 398-8388 $30 ©1987	Submarine simulator with a wide variety of WWII scenarios, including patrols in addition to battle reenactments. Variable speeds lets you play up to 32 times faster than normal.—DELSON	C 64/128. Joystick recommended.	6-month warranty. $5 thereafter. $10 for backup. Not copy-protected.	★★★	★★★	★★★	★★★	D	★★★

RATINGS KEY **O** Overall performance; **D** Documentation; **PS** Play system; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

*Titles listed for the IBM PC/PC*jr* will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 72 for information such as backup policies and addresses of software publishers.

HOME BUSINESS & PRODUCTIVITY

Electric Pencil PC

HARDWARE REQUIREMENTS: IBM PC.
PUBLISHER: Electric Software Corp.
PRICE: $50

"Pssst. Hey buddy! Wanna buy a terrific word processor real cheap?" You're about to be sold a plain, ordinary pencil, right? No, it's *Electric Pencil*, a full-featured $50 word processor that runs circles around software that costs five times as much. Never heard of it? Well, it's been around for more than 10 years and was "the industry's very first word processor." Of course it's been totally revised since then.

Electric Pencil does all of the normal word-processing tasks (such as search-and-replace), but look at some of its special features. When you're entering and editing text, you can use as many as six "windows" and switch back and forth from one to another. You can insert nonprinting comments as reminders to yourself anywhere in the text. If you want, the program will automatically save your work at periodic intervals (just tell it how long to wait between saves).

And there's a spelling checker—well, actually two checkers, one with 50,000 words and the other with 100,000 words. Both can be modified with your own words, and both can be used to automatically hyphenate words.

When it's time to print, you can include page headers and footers up to 10 lines long, change them anywhere in the manuscript, and even flip-flop their format on odd and even pages. You can also embed elaborate nonprinting controls in your text; for example, you can tell the program to stop printing at some point, ring a bell, remind you to change the daisywheel, and wait for a key press before continuing.

However, *Electric Pencil* is no magic wand; it lacks outlining capacity, automatic footnoting, and mail merge. Moreover, although the software provides for underlining and boldface, you'll have to embed printer control commands if you want italics, superscript, subscript, or a different font. Which brings us to an important qualifier: *Electric Pencil* had its roots among hobbyists, and it will appeal most to folks who don't go for automatic transmissions and power steering and like to stay close to the action. Therefore, it is not the best word processor for rank beginners, for children, or for others who aren't comfortable exercising hands-on control.

But if you fit the bill, you'll find *Electric Pencil* to be a stunningly powerful and flexible word processor at a fraction of the price of equally powerful programs. —TONY MORRIS

First Draft

HARDWARE REQUIREMENTS: 64K Apple, IBM PC.
PUBLISHER: Scholastic Software
PRICE: $70

"Someday I have to get organized." I had said that so many times that even I was tired of hearing it. However, when I began using *First Draft*, I knew that the time to get organized was *now*.

First Draft is an "idea processor," an outlining tool that can help anyone to organize thoughts and lists of items into manageable order. I created an annotated address book, brainstormed this article, and then prepared a presentation with the help of *First Draft*.

You list ideas, rearrange the words and phrases in any logical order, move main ideas so they appear as headings and less important items as subheadings, and group similar ideas together. Then you can regroup these ideas, write yourself notes that you can hide when you want, expand the notes, and print the outline in several versions.

When my 15-year-old daughter, Debbie, needed to write a report on Shakespeare's life and times, she used *First Draft*. Her three main headings were The Shakespearean Era, Shakespeare's Life, and Shakespeare's Work. She had three subheadings for each section, supported by many single items and paragraphs. *First Draft* automatically placed numbers and letters at the beginning of each item and ranked and sorted the items as directed.

Debbie printed out her outline, saved it, and then did more research in the specific areas where information was lacking; it was easy to see what was needed. When Debbie returned to her outline with the additional information, she was able to fill in the blanks and expand upon her thoughts. While she was able to print out her first draft with *First Draft*, she preferred using her word processor for revising and printing the final draft. The only real limitation of the program was that, in the Apple version, to capture the outline with her word processor, Debbie first had to convert the file from DOS 3.3 to ProDOS. Don't fret: an Apple ProDOS version is planned.

In spite of that one limitation, Debbie also used *First Draft* to help her brainstorm articles for the school newspaper. Oh, yes, I am becoming organized with *First Draft*. I'm working on my disk and book collections and someday soon I'll set up my family tree (with all the nuts in the branches). —GWEN SOLOMON

Ready!

HARDWARE REQUIREMENTS: IBM PC.
PUBLISHER: Living Videotext
PRICE: $100

Ready! is an outlining program that lets users organize information and ideas in a structure consisting of headings, subheadings, sub-subheadings, and so forth. Unlike most outliners, *Ready!* is memory resident. That means that you load it once each session, and it's instantly available from then on, even while you're working with another application program.

A *Ready!* outline consists of a series of one-line entries, with subpoints indented underneath. Each subhead is linked to any points indented beneath it, which makes it easy to move information around quickly. Say you are outlining a

speech with several main sections, each with a number of subheads. If you decide to change the order and swap Section 2 with Section 4, you don't have to manipulate each individual subhead or highlight all the text you want to move as you would with a word processor. Instead, you move the main section headings, and all the subheads come along for the ride.

For many users, the real beauty of *Ready!* has nothing to do with structuring ideas. The program is a wonderful way to organize frequently used reference material for instant access. Need a chart of item shipping-weights, or zip codes, or teacher room-assignments, or inventory, or videotapes in your collection? No problem. Make each item a heading and put the details in subheads, ready when you need them, but not cluttering up the overall view. The nimble Search function will locate a requested phrase anywhere in the outline—even in levels that are currently collapsed and therefore not visible.

Ready! is not the right tool for text-heavy outlining chores. While several other outliners let you attach paragraphs to headings, *Ready!* is limited to single-line entries. There is also a 32K ceiling on the size of any outline, although you can fit a lot within this limitation.

For bringing order to ideas and putting facts at your fingertips, *Ready!* is ready, willing, and able.

— STEVE MORGENSTERN

EDUCATION & CREATIVITY

The American Investor

HARDWARE REQUIREMENTS: 512K IBM PC.
PUBLISHER: Blue Chip Software
PRICE: $150

Puts, calls, spreads, straddles. Are they poker plays or gymnastics routines? Neither, but if you'd like to understand these terms, and—better yet—understand how to use them in stock-market trading, then *The American Investor* may be just the ticket. The latest in a series of financial simulations (*Baron*, *Squire*, and *Millionaire*, among others) from Blue Chip Software, *The American Investor* is also the most ambitious, complex, and challenging one yet.

Starting with a cash account of up to a million dollars (and a compara-

ble margin account), your objective is to maximize profits over a nine-month period by trading on the American Stock Exchange. To help you make decisions, *The American Investor* provides a mountain of data based on real market information for the period July 1985 through March 1986. Daily market indexes, news headlines, dividend notices, and price quotes for stocks and options are provided, along with graphs of the weekly prime-interest rate, T-bill rates, and monthly short-interest rates. In addition, the software provides fundamental research data, including a complete background and financial history for the previous four years for any of 47 companies.

The strengths of *The American Investor* are obvious; in fact it's difficult to imagine what else could have been included to improve the simulation. But it's equally obvious that this is not a package for the investing beginner. Although a brief, general introduction to stock-market trading is included, our son, Jon, (entering his senior year in college as an economics major) found himself confused by the jargon and technical explanations. However, he and I agree that this would be a superb package for someone who has already read several books on the stock market, is relatively knowledgeable about investment strategies, and is itching for a chance to try things out.

Another concern goes more to the heart of this particular simulation; the software covers just nine months, so long-term investing (which the manual itself identifies as the "most successful approach") is impossible. And since the included information is real (even the Union Carbide accident in India is reported), there is no way to start over from scratch.

However, if you're a thorough investor, it's unlikely that the simulation will take less than several months to complete, so you'll certainly get your money's worth.

—TONY MORRIS

Author! Author!

HARDWARE REQUIREMENTS: Apple.
PUBLISHER: MindPlay
PRICE: $60

Debbie's career as a dramatist began in fourth grade with a script she called *King Arthur's Problems*. It was costumed, rehearsed, and ably performed for the cast's parents. In those precomputer days, the playwright's mother (me) typed the script using several carbons.

Debbie's efforts in sixth grade coincided with a mythology unit, and *Zeus Goes to Washington* was the first dramatic script in our household created with a word processor.

Now, better than a word processor and swifter than an outline generator is *Author! Author!*—a program specifically designed for playwrights ages 7 to 17. You can easily create and revise outlines, scenes, sets, and playbills. And if a producer, actors, and live audience are lacking, the computer's screen becomes your theater. The program lets you select colorful fixed and animated graphics, save them along with the script, and then display a scene or the entire performance as often as you like.

While the program is fun to work with and visually exciting, it can also help you learn a great deal about playwriting. You can either respond to standard outline questions that guide you in creating your script or custom design a script to meet your own specifications. You can build and change the cast of characters, props, comments, and speeches on the screen.

Debbie recently completed her ninth-grade production, *Murder At Camp*, with the help of *Author! Author!* Out of the eight choices of backdrops, she selected a stand of trees to use as the camp theater,

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CIRCLE READER SERVICE 33

and a schoolroom set worked well for the nurse's office. Props (from a choice of 56 items) were the usual tables, chairs, lamps, trees, windows, and doors, plus ominous-looking objects such as a candlestick, a knife, and a rope.

The cast of characters included both normal and odd-looking "graphic" people who dramatically entered and exited scenes and moved around. Debbie saved her production to disk and arranged for command performances.

Let's hear applause! applause! for *Author! Author!*—the program that helps budding playwrights.

—GWEN SOLOMON

ENTERTAINMENT

Earl Weaver Baseball

HARDWARE REQUIREMENTS: 512K Amiga.
PUBLISHER: Electronic Arts
PRICE: $50

The only things missing in *Earl Weaver Baseball* are the hot dogs. With its unprecedented graphics, sound (including voice synthesis and stereo effects), and smooth play system alone, this would be a great game. But the addition of extremely detailed player statistics and manager options make this the best baseball simulation to date.

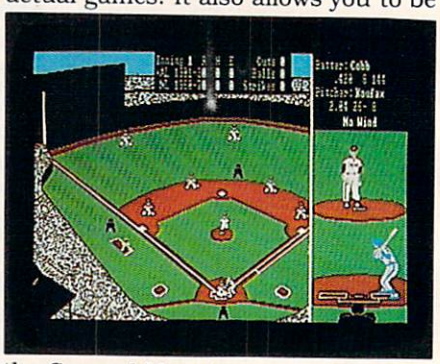
Play is conducted with a split-screen view, one of the whole field, and the other centering on the pitcher and batter. Pitching and batting are straightforward, although hitting a 95-mph heater (the speed can be checked with the radar-gun option) requires quick reflexes.

If your eye-hand coordination isn't up to the job or if you simply want to concentrate on the intellectual side of baseball, you can opt to manage only. This in itself is a large task.

Two people can play, or you can take on Earl himself in the form of the computer. Since the game was developed with the advice of Earl Weaver (erstwhile manager of the Baltimore Orioles and one of the winningest managers in Major League history), the computer is a tough opponent indeed. Fortunately you can give Earl a handicap if he's too tough, and you may ask for his help at any time.

Before the game actually starts, however, you'll have to pick your team (from those provided with the game or one you've created yourself from the available players) and the ballpark you want to play in (again, from those on the disk or one you've created). Further, you must select your starting pitcher and lineup; or if you want to get right down to business, have Earl do it for you.

Earl Weaver Baseball doesn't stop at just letting you play and manage actual games. It also allows you to be



the General Manager or even the Commissioner. As the General Manager, you may trade, draft, and create players, while as the Commissioner you can create new leagues and teams or simply grant everybody the day off. Those with a sense of history will appreciate the option that automatically updates player statistics after every game.

One of my only real complaints is that the computer always controls the fielding—except for the throwing—even if a more arcade-style game is desired. Also, the pitching is not as detailed as it could have been, allowing three general speeds in only three zones, with large variations in pitch height not allowed for. The biggest fault, of course, is the absolutely unforgivable lack of hot dogs.

—DAVID LANGENDOEN

EOS: Earth Orbit Stations

HARDWARE REQUIREMENTS: 64K Apple, C 64/128.
PUBLISHER: Electronic Arts
PRICE: $30–$35

In the midst of all the controversy surrounding the Strategic Defense Initiative (also known as Star Wars), there has been little attention paid recently to the peaceful uses of space. *EOS* changes that. In this imaginative and highly challenging entertainment for one to four players, you build and operate up to 32 space stations, each designed to

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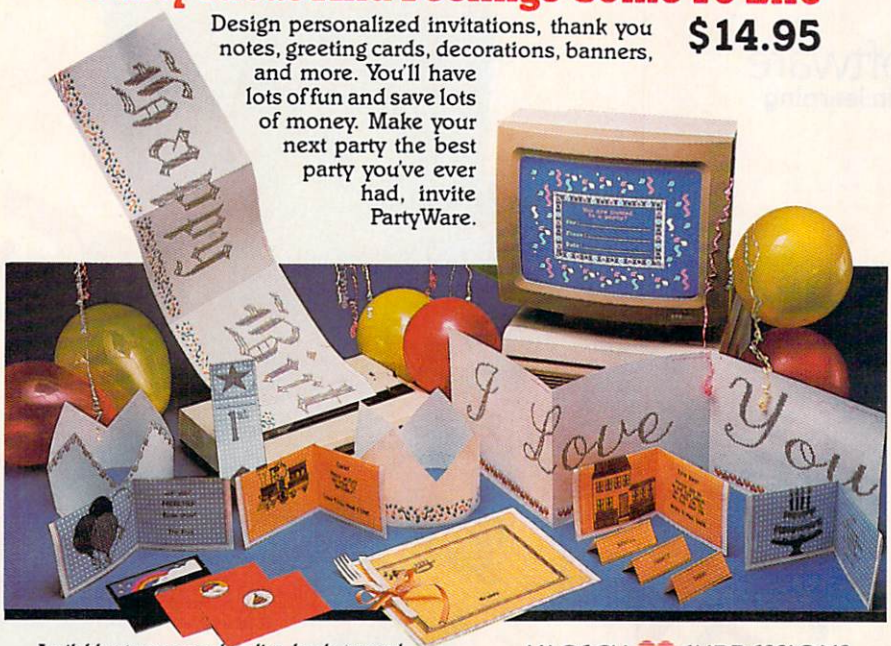

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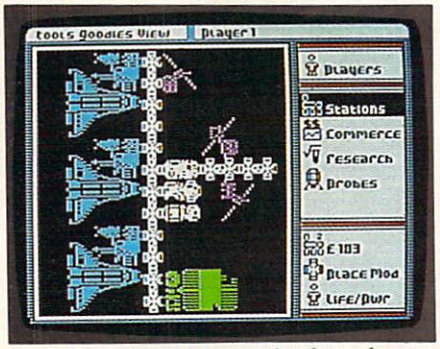

serve humankind as a high-tech research platform, to turn a profit as a commercial enterprise, or both.

You become involved with seven increasingly complex missions; each builds upon the knowledge and experience gained in previous ones. Missions range from constructing a lone research platform in Earth orbit to establishing an entire space colony and contributing to the search for other life-forms.

Played alone or in teams, *EOS* requires imagination, resource management, a good sense of spatial relationships, and a keen business mind. Imagination is required to be able to see yourself actually living and working in space. Resource management is needed to balance your stations' components into effective commercial and research platforms. Your spatial sense is brought into play when laying out each space station, for the components are irregularly shaped and must be fitted together to maximize a limited area. And a business mind helps you tap into the game's ever-changing "stock market" approach to the commercial possibilities of space: Which ventures will be more likely to turn a profit and therefore allow you to expand faster and more efficiently than your competitors?

EOS is highly recommended for all family members and is ideal for group play. Parents can share the excitement of space with their children. Sibling rivalries can be shelved as kids work together towards a realistic goal. And the reality of space exploration and what it may mean to the future of this planet can be stressed, instead of the potentially scary vision of space as a future battlefield. —JAMES DELSON

Superstar Ice Hockey

HARDWARE REQUIREMENTS: C 64/128, IBM PC.
PUBLISHER: Mindscape, Inc.
PRICE: $35–$40

The puck is slapped across the ice, caroming off the wall to be picked up by the center, who brings it into scoring range. He shoots, and it's deflected. But a teammate retrieves the puck, passes it back to the center—and this time it's good!

As the best simulation yet of the national game of Canada, *Superstar Ice Hockey (SIH)* is a vast improvement over the first hockey programs which appeared over two years ago. By incorporating all the advances made in other team-sports games such as football, soccer, and basketball, *Superstar Ice Hockey* is a welcome addition.

Gamers can opt to play in a number of ways, from simple two-on-two play to more complex four-on-four or regulation six-player teams. Two-player or solitaire games are available, and the straightforward play system can be modified. Furthermore, you can choose to control your goalie, your center, or both; and you can also adjust the ability of your supporting teammates.

If playing General Manager for a team is more to your liking, *SIH* lets you recruit a whole roster of players, and then send them into competition against other teams in a league. You can play an entire season of hockey, during which time you can trade and fire players, recruit new ones, and even train your existing team members.

Finally, another option allows you to coach your team, designing strategic moves for offense and defense, changing the lineups for each game, and actively participating in the game from the sidelines as your players do their best to overwhelm the opposition.

As a fast-moving, action-packed competition, *SIH* can really tire your hands. Playing either the computer or another gamer, it's a nonstop struggle to gain control of the puck, move it up the ice, and score before your opponents steal it from you and try to push it past your goalie. Penalties for rough play are included, so don't be too aggressive; but you can't win this game by being Mr. Nice Guy. Some body-checking and roughing are bound to occur on the ice. *SIH* is one of the best sports simulations I've seen in a long time. —JAMES DELSON

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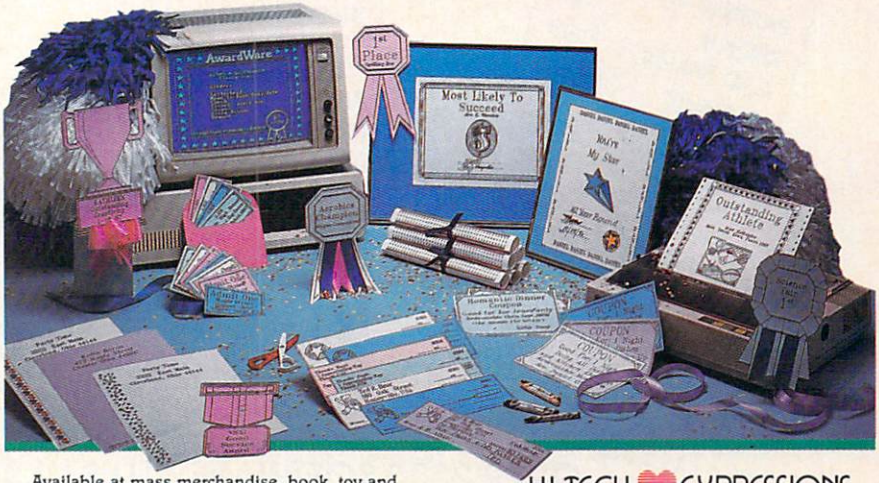

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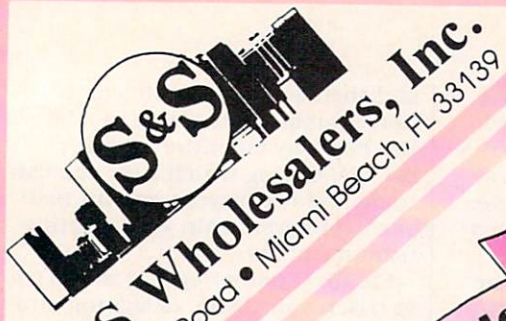

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CIRCLE READER SERVICE 32

the Programmer

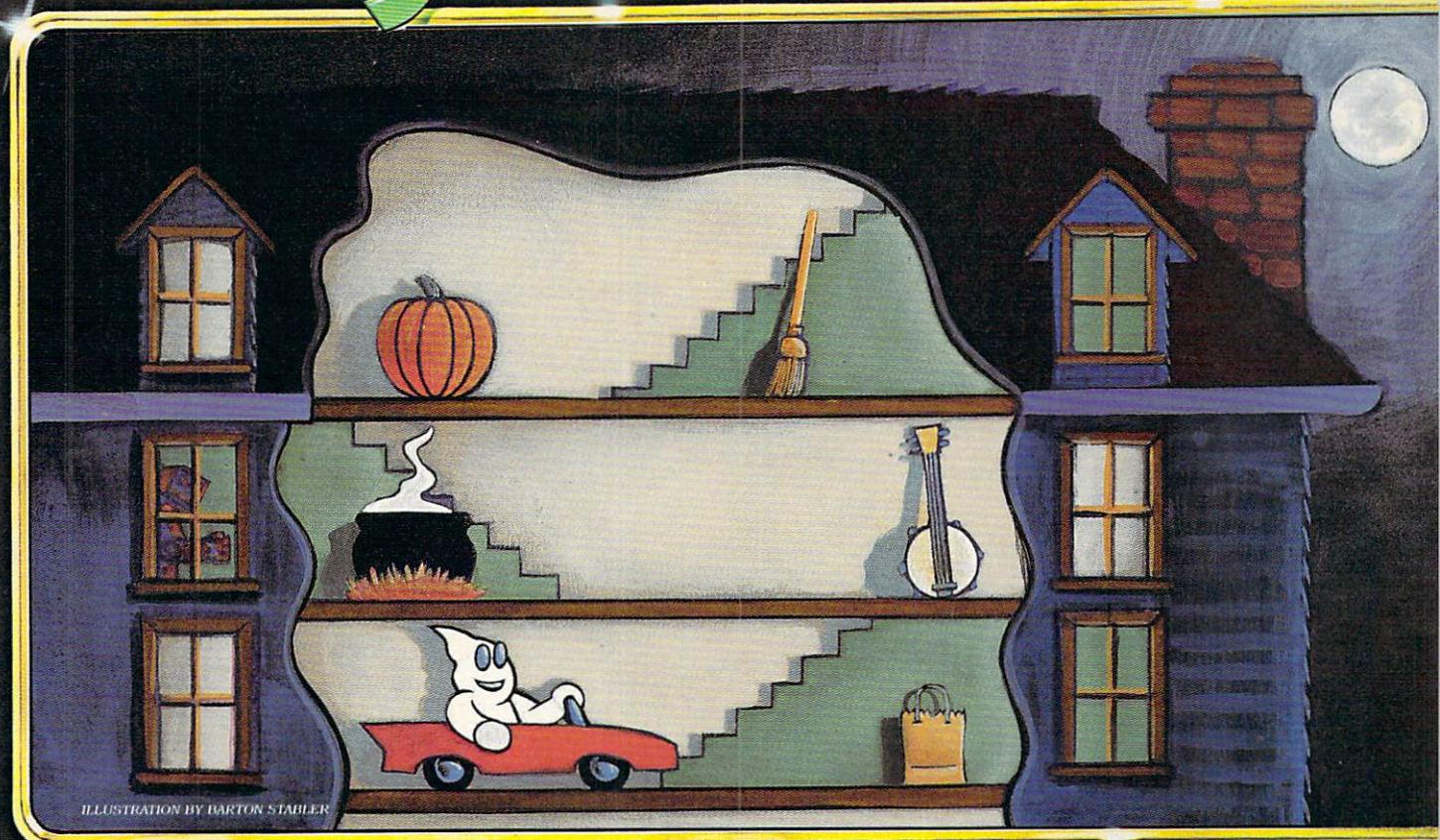

ILLUSTRATION BY BARTON STABLER

★ OCTOBER ★

FYI
Page 84
Information about our programs and news for programmers.

PRODUCTIVITY PROGRAM
Page 86
Use our *Home Inventory Manager* program to keep up-to-date records of your valuables.

TIPS TO THE TYPIST
Page 96
How to type in our programs.

HALLOWEEN PROGRAMS
Page 96
Two Halloween treats include *Ghostsitter* for the IBM and a colorful *Jack-O'-Lantern* graphic.

MICROTONES
Page 100
The Duelin' Computer will make your computer room sound like a barn at a bluegrass festival.

ILLUSTRATION BY JIM CHERRY III

THIS MONTH'S PROGRAM COVERAGE

Computers†	Jack-O'-Lantern (pg 98)	Ghost-sitter (pg 96)	Home Inventory Manager (pg 86)	Puzzle Clues (pg 100)	The Duelin' Computer (pg 100)
Adam	★			★	
Apple IIgs	★		★D p	★	
Apple II series	★		★D p	★	
Atari 800/XL/XE	★		Nov '87	★	★
Commodore 64/128	★		Nov '87	★	★
IBM PC FAMILY					
IBM PC	★	★A C	★D p	★	
IBM PC*jr*	★	★C	★D p	★	★T
IBM PS/2 Model 30	★	★A	★D p	★	
IBM PC COMPATIBLES					
Amstrad PC1512DD	★	★C	★D p	★	
Blue Chip	★	★C	★D p	★	
Commodore PC-10	★	★C	★D p	★	
Epson Equity I	★	★C	★D p	★	
Kaypro PC-10	★	★C	★D p	★	
Leading Edge Model D	★	★C	★D p	★	
Panasonic FX-600	★	★C	★D p	★	
Tandy 1000/EX/SX	★	★C	★D p	★	★T
Vendex Turbo 888-XT	★	★C	★D p	★	
Zenith Z148PC	★	★C	★D p	★	
Macintosh			★D p	★	★
Tandy Color Computer	★			★	
TI-99/4A	★				★

Key ★ Program in this issue for this computer, A Advanced BASIC required, C Color monitor required, D Disk drive required, p Printer optional, T Television or monitor with speaker required, † see below for specific models.

THE SYSTEMS WE TEST ON

Every FAMILY & HOME-OFFICE COMPUTING program is thoroughly tested before publication. The exact systems we use during the testing process are listed here. While you can be sure that a program will work if your system matches ours, a comparable system configuration should also work. For example, even though we don't test on the Franklin Ace, Apple programs should work on this system. Any exception to the following hardware or software configurations will be listed in the chart above. Systems that do not have a specific printer listed were tested with Epson FX-80 printers when a printer option was available.

Adam w/80K RAM, Coleco SmartBASIC V1.0, disk enhanced by MMSG, Coleco disk drive, AdamDOS, and color monitor. **Apple IIe** in 40-column mode w/64K RAM, DOS 3.3, two disk drives, MPC parallel printer interface, monochrome and color monitor. Apple programs should also work on Apple IIc/II Plus. **Apple IIgs** w/1MB RAM, one 3.5-inch and one 5.25-inch disk drive, ProDOS 3.3, and Apple RGB monitor. **Atari 800XL** w/two disk drives, DOS II version 2.05, Atari 850 interface, and color monitor. Atari programs should also work on Atari 800 (w/48K), 1200XL, 65/130XE. Smaller programs should work on Atari 400 & 600XL. **Commodore 128** in C-64 mode with two 1571 disk drives, color monitor, and Micrografix parallel graphics interface. Programs should also work on Commodore 64/64C/128D. **IBM PC** w/640K RAM, Disk BASIC D2.00, IBM Monochrome Display and Printer Adapter, monochrome monitor, IBM Color/Graphics Monitor Adapter, RGB monitor, AST Sixpack Plus, and IBM PC DOS 3.10. **IBM PC*jr*** w/128K RAM, one disk drive, IBM PC DOS 2.10, cartridge BASIC J1.00. **IBM PS/2 Model 30** w/640K RAM, one floppy and one hard-disk drive, RGB monitor, IBM PC DOS 3.30, and IBM PC BASIC A3.30. **Macintosh** w/512K RAM, two disk drives, Microsoft BASIC 2.1, and ImageWriter printer. Macintosh programs should also work on 128K Mac/Mac Plus/SE/II and under Microsoft BASIC 2.0. **Tandy Color Computer 2** w/64K RAM, Disk Extended Color BASIC 1.1, two disk drives, Botek-serial-to-parallel printer interface, color monitor. Programs should also work on Color Computer 1 (w/64K) and 3. **TI-99/4A** w/8K RAM, peripheral expansion system, disk drive, RS232 Interface Card, and TI-99/4 Impact Printer.

The following PC compatibles have been added to our testing list. IBM PC programs should also work on other PC compatibles with at least 128K.

Amstrad w/640K RAM, two disk drives, MS-DOS 3.20, Locomotive BASIC, RGB monitor. **Blue Chip** w/512K RAM, two disk drives, monochrome monitor, MS-DOS 3.20, GW-BASIC 3.20. **Commodore PC-10** w/640K RAM, two disk drives, monochrome monitor, MS-DOS 3.20, GW-BASIC 3.20. **Epson Equity I** w/256K RAM, two disk drives, monochrome display adapter, monochrome monitor, MS-DOS 3.10, GW-BASIC 3.10. **Kaypro PC 10** w/640K RAM, two disk drives, RGB monitor, MS-DOS 2.11, GW-BASIC 2.02. **Leading Edge Model D** w/640K RAM, two disk drives, monochrome and RGB monitors, MS-DOS 3.10, GW-BASIC 3.11. **Panasonic FX-600** w/640K RAM, two disk drives MS-DOS 3.10, GW-BASIC 3.10, enhanced graphics adapter, RGB monitor. **Tandy 1000** w/256K RAM, two disk drives, MS-DOS 2.11 version 02.11.22, GW-BASIC 2.02 version 01.01.00, RGB monitor. **Tandy 1000 EX** w/256K RAM, two disk drives, MS-DOS 2.11 version 02.11.24, GW-BASIC 2.02 version 01.02.00, RGB monitor. **Tandy 1000 SX** w/384K RAM, two disk drives, MS-DOS 3.20 version 03.20.00, GW-BASIC 3.20 version 03.20.00, RGB monitor. **Vendex Turbo 888-XT** w/640K RAM, two disk drives, MS-DOS 3.20, RGB monitor. **Zenith Z148PC** w/640K RAM, two disk drives, MS-DOS 3.10, GW-BASIC 3.20, RGB monitor.

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RESOURCES FOR IIgs PROGRAMMERS

There are several new books for Apple IIgs programmers published by Addison-Wesley. Included in the new IIgs line-up are the *Technical Introduction to the Apple IIGS* and the *Apple IIGS Firmware Reference*. The books provide a comprehensive reference to the Apple IIgs's internal programs and subroutines. Other IIgs titles include a hardware reference, ProDOS 16 reference, and Gary B. Little's *Exploring the Apple IIGS*. Prices range from $10–$30.

TIPS FOR C 64/128 USERS

The Beagle Bros. have a new book, *The Big Tip Book for the Commodore 64/64C/128*, which offers useful shortcuts and tips for dealing with BASIC, machine language, hardware, and communications on the Commodore. The book is easy to read, with funny illustrations and examples to help explain programming tricks for both beginning and advanced Commodore users. *The Big Tip Book* is $16.95 from Bantam Books.

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HOME INVENTORY MANAGER

Use Our Program to Track Your Valuables

BY PASQUALE M. CIRULLO

What is your grandmother's silver worth? What is the serial number of the color television? When did you buy the IBM PC? When questions like these arise, the typical family has to plow through piles of papers to find the answers—if they can find them at all.

You need to know the value of your belongings in order to purchase the correct amount of insurance—and to document your claims in case of fire or loss. Police officers require serial numbers in order to verify whether stolen goods they've recovered are yours. When you need repairs or when you try to claim your computer as a tax deduction, you'll want to know the purchase date.

Do you know where these records are? I went looking for mine recently and couldn't find some of them. Most people don't really think about their records until they have to and then go crazy looking for them. In order to prevent future headaches, we decided to write this program. *Home Inventory Manager* will help you keep organized records of all your belongings (up to 1,000 items in each file—500 items on the Apple II—with an unlimited number of files) along with their model numbers, serial numbers, values, locations, and other useful information.

USING *HOME INVENTORY MANAGER*

Begin by typing the program into your computer, SAVEing it to disk, and RUNning it. (Due to the length of the program—and the importance of the material being saved—we recommend that you test the program fully before using it for your actual belongings.) You'll see a menu with three choices: ‹S›TART A NEW INVENTORY, ‹U›SE AN EXISTING INVENTORY, or ‹E›XIT THE PROGRAM.

If you choose ‹S›TART A NEW INVENTORY, the program will ask you for a name that you want to use for this inventory. The name that you enter must be no longer than eight characters and cannot include spaces or punctuation marks. Except on the Macintosh, you can enter a question mark to see a list of your files if you are unsure what name to use. Do not add an extension to the name since the program will automatically add it for you. Once you have entered the inventory name, you'll go directly to a screen where you can enter the descriptions of new items. *(See "Using the Editor," below, for information on entering your descriptions.)* Pressing RETURN (or ENTER) adds the item you've just entered to the current inventory and clears the screen so you can enter the next item. If you leave Item blank and press RETURN, you'll go to the command screen, which is discussed below.

‹U›SE AN EXISTING INVENTORY lets you look at an inventory file that you entered previously. The computer will ask you for the name of the file you want to use, load the file from disk, and then display the command screen. Again, if you enter a question mark instead of a file name, the computer will show you a list of all the files on your disk.

‹E›XIT THE PROGRAM will allow you to leave *Home Inventory Manager* and do other things with your computer. You must leave the program through this menu item so as to close all your files and return the computer to normal operation.

THE COMMAND SCREEN

If you choose ‹U›SE AN EXISTING INVENTORY from the initial menu, you will arrive at the command screen. The command screen controls all operations on the current inventory. It displays the current record (the description of one item), the total number of items in the inventory, the total value of all items in the inventory, the name of the inventory file, and all the available commands (described below). To choose a command, press its first letter.

Add

This command allows you to add new items to your inventory list. This command displays the same input screen as ‹S›TART A NEW INVENTORY and works exactly the same way. *(See "Using the Editor" for information on entering new records.)*

Back

The program will display the previous record in your inventory. If you are presently viewing the first record, the computer will beep. This command is affected by the Item and Location commands which are discussed below.

Catalog

You will be asked, "What drive are the files in?" The computer will then display the names of all files on the disk in that drive. If you want to view the files on the default drive, just press RETURN or ENTER. (This command is not available on the Macintosh version.)

(On the Apple version, the drive you specify will become the default drive.)

Delete

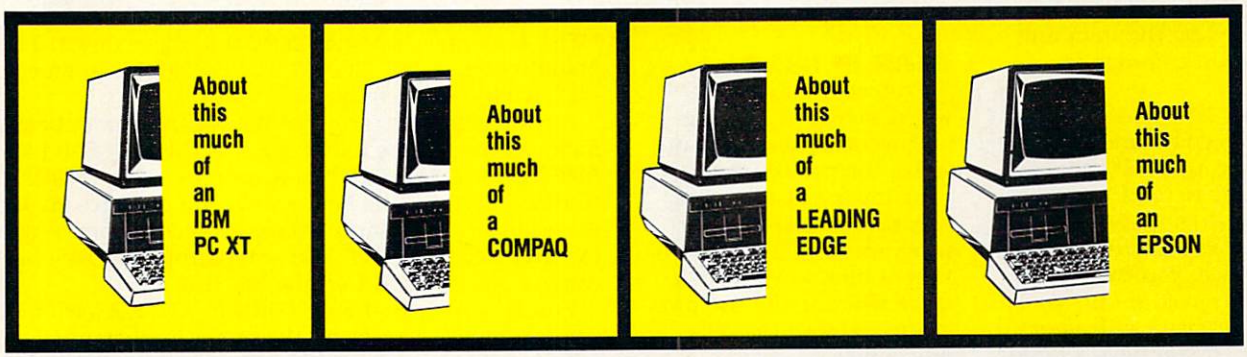
This command will delete the record of any item that you no longer own. The computer will ask you to confirm that you want to delete that record. If you don't want to delete it, press N.

Edit

Choose Edit when you want to make corrections to a record. The computer will place the cursor at the beginning of the item line and wait for your

ILLUSTRATIONS BY JOSH GOSFIELD

How much computer will $699* buy?



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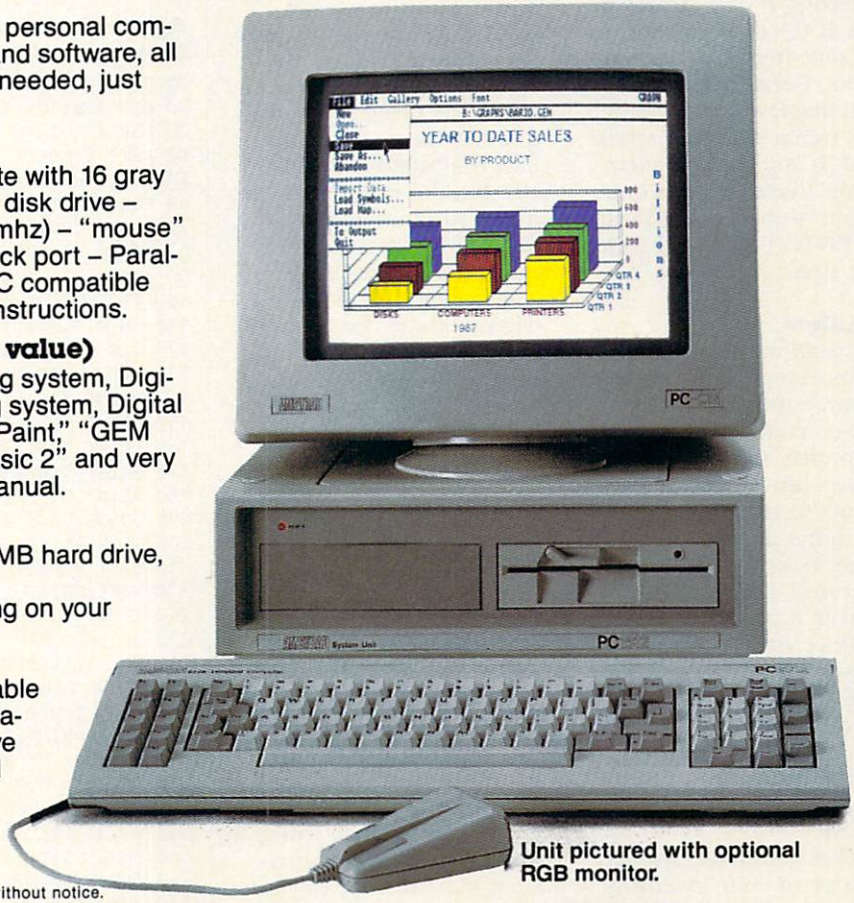

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changes. *(See "Using the Editor" for information on editing your records.)*

Forward

The program will display the next record in your inventory. If you are presently viewing the last record, the computer will beep. This command is affected by the Item and Location commands.

Item

This command will allow you to advance directly to (and browse through) specific records of a particular item. For instance, you can use Item to look at only your televisions or only your rings. If you have a large inventory, this is much quicker than repeatedly pressing B or F until you reach the desired record.

Once Item has been set, Back, Forward, and Print will display or print only the items you have specified. If you want to view other items, choose Item again and press RETURN or ENTER when asked for the item.

Location

Location is just like Item except that you will browse through items in a particular location. For instance, it will allow you to see (and print) only the items in the living room or items in your safe-deposit box—or will help you find a book that you lent to a friend.

Once Item or Location has been set, an asterisk will appear next to the number of Items at the top of the screen to remind you.

Print

This command will let you print your inventory on paper. You can choose to print only the currently displayed record or your entire file. If Item or Location has been set, the computer will print only a partial list.

Quit

Quit will automatically save your present inventory to disk and then return to the initial menu.

Save

This command will save the current inventory on your disk and let you continue working with it.

BEAR IN MIND

Problems may arise when saving or loading an inventory file. To minimize the problems, keep your inventory files on a separate disk from your programs and always keep a disk in your disk drive when using the program. Remove the disk only when you have exited the program.

When asked for a file name, don't use more than eight characters and don't use an extension. This is necessary because when the program creates a file for your inventory list, it actually creates two files—a sequential file and a random-access file—with the same name but different extensions. These files can be seen when you ask for a catalog of your disk.

Also, the total value shown at the top of the screen is the value of all the items. The program adds the value, not price, field for each record. When entering this number, do not use a dollar sign as the computer will evaluate it as zero.

AND DON'T FORGET

Be sure to keep a backup copy of your inventory files and store it in a safe place—preferably in a safe-deposit box or somewhere else outside your home. You may want to keep a paper copy of your inventory handy, too.

Always leave the program through the Exit option of the initial menu. Some of your data may be lost if you break out of the program.

USING THE EDITOR

Whenever you choose to ‹START› A NEW INVENTORY, Add, or Edit an entry, the program enters Editor mode, and only certain keys will work with the Editor.

The BACKSPACE key will delete a character to the left of the cursor. On the Apple II series of computers, CTRL-B will also work.

To move the cursor from one field to another, use the UP-ARROW and DOWN-ARROW keys (not the ENTER key) on the IBM PC and compatibles. On the Apple II series, either use the UP and DOWN arrow keys or use CTRL-K to move up and CTRL-J to move down. The Macintosh uses OPTION-W and OPTION-S to move up and down, respectively.

If you make an error in typing, you can move back and forth on the line by using the LEFT-ARROW and RIGHT-ARROW keys. Use OPTION-A to move left and OPTION-D to move right on the Macintosh. You can also switch between Insert mode and Overtype mode by pressing the INSERT key on the PC and compatibles, CTRL-I on the Apple II, or OPTION-I on the Macintosh.

Finally, only use the RETURN or ENTER keys when you are finished entering the record and want to move to the next record. In Edit mode, pressing RETURN or ENTER will redisplay the command screen.

Apple II series w/DOS 3.3 (printer optional)/
Home Inventory Manager

```
10 DIM CO(10),L(10,2),RN(500),RO(10),VA(500),CK$(7)
20 DIM IN$(10),IT$(500,2),LB$(10),MD$(1)
30 FOR X = 1 TO 10:RO(X) = X+2:READ L(X,1),L(X,2)
40 NEXT X:FOR X = 1 TO 10:READ LB$:LB$(X) = LB$+": "
50 CO(X) = LEN(LB$(X)):NEXT X
60 FOR X = 1 TO 7:READ T:CK$(X) = CHR$(T):NEXT X
70 SP$ = CHR$(32):BL$ = ""
80 FOR X = 1 TO 39:BL$ = BL$+SP$:NEXT X
90 A1$ = LEFT$(BL$,3):A2$ = LEFT$(BL$,25):D$ = CHR$(4)
100 F$ = "":G$ = CHR$(7):MD$(0) = "INSERT"+SP$+SP$
110 DN = 1:MD$(1) = "OVERTYPE":SL = 0:ONERR GOTO 8500
120 SI$ = "":SS$ = "":VT = FRE(A)
130 HOME:VTAB 4:PRINT TAB(15);"WELCOME TO":VTAB 6
140 PRINT TAB(9);"HOME INVENTORY MANAGER":VTAB 8
150 PRINT "DO YOU WANT TO:":PRINT
160 PRINT "<S>TART A NEW INVENTORY,"
170 PRINT "<U>SE AN EXISTING INVENTORY, OR"
180 PRINT "<E>XIT THE PROGRAM?"
190 GOSUB 9000:Z = 0:FOR X = 1 TO 3
200 IF MID$("SUE",X,1) = Z$ THEN Z = X:X = 3
210 NEXT X:ON Z GOTO 230,300,570:GOTO 190
230 HOME:PRINT:INPUT "ENTER NAME FOR NEW FILE: ";F$
240 IF F$ = "" THEN 130
250 IF F$ = "?" THEN GOSUB 2000:GOTO 230
260 NR = 0:GOSUB 10500:GOSUB 7000:GOSUB 9500
270 IF NR = 0 THEN 400
280 DN = 1:REC = RN(1):GOSUB 11500:GOTO 390
300 HOME:PRINT:INPUT "ENTER FILENAME: ";F$
310 IF F$ = "" THEN 130
320 IF F$ = "?" THEN GOSUB 2000:GOTO 300
330 PRINT D$;"OPEN";F$;".SEQ"
340 PRINT D$;"READ";F$;".SEQ":INPUT NR:FOR X = 1 TO NR
350 INPUT IT$(X,1):INPUT IT$(X,2):INPUT RN(X)
360 INPUT VA(X):NEXT X:PRINT D$;"CLOSE ";F$;".SEQ"
370 GOSUB 10500:DN = 1:REC = RN(1):GOSUB 11500
390 IF NR <> 0 THEN 430
400 PRINT D$;"CLOSE ";F$;".RAF":HOME:PRINT
410 PRINT "THERE ARE NO ITEMS IN THIS FILE."
420 GOSUB 6000:GOTO 120
430 V = 0:FOR X = 1 TO NR:V = V+VA(X):NEXT X
440 GOSUB 7000:GOSUB 7500:VTAB 15
450 PRINT "CHOOSE FROM THE FOLLOWING COMMANDS:"
```

→

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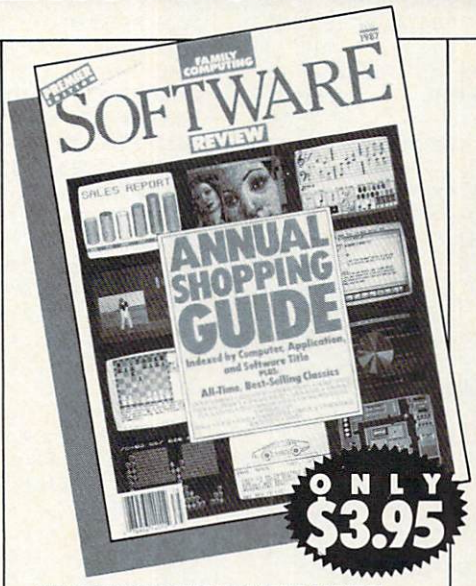

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FAMILY & HOME OFFICE COMPUTING

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```
460 PRINT "<A>DD, <B>ACK, <D>ELETE, <E>DIT,"
470 PRINT "<F>ORWARD, <I>TEM, <L>OCATION,"
480 PRINT "<P>RINT, <Q>UIT, OR <S>AVE."
490 VTAB 21:PRINT BL$:VTAB 21:PRINT "COMMAND: ";
500 GOSUB 9000:PRINT Z$
510 IF Z$ = "Q" THEN GOSUB 5500:GOTO 120
520 Z = 0:FOR X = 1 TO 10
530 IF MID$("ABDEFILPS",X,1) = Z$ THEN Z = X:X = 10
540 NEXT X:IF Z = 0 THEN PRINT G$;:GOTO 490
550 ON Z GOSUB 1000,1500,2500,3000,3500,4000,4500,5000
,5500:GOTO 390
570 IF NR <> 0 THEN GOSUB 5500
580 HOME:POKE 216,0:END
1000 GOSUB 6500:GOSUB 9500:REC = RN(1)
1010 GOSUB 11500:RETURN
1500 D = DN
1510 IF D = 1 THEN PRINT G$;:RETURN
1520 D = D-1:SF = 0:IF SL <> 0 THEN IF LEFT$(IT$(D,2),
SL) = SS$ THEN SF = 1
1530 IF IT$(D,1) = SI$ OR (SI$ = "" AND SS$ = "") OR S
F THEN DN = D:REC = RN(DN):GOSUB 11500:RETURN
1540 GOTO 1510
2000 HOME:PRINT
2010 INPUT "WHAT DRIVE ARE THE FILES IN? ";DR$
2020 IF DR$ = "" THEN HOME:PRINT D$;"CATALOG":PRINT:GO
SUB 6000:RETURN
2030 IF LEFT$(DR$,1) <> "," THEN DR$ = ","+DR$
2040 HOME:PRINT D$;"CATALOG";DR$:PRINT
2050 GOSUB 6000:RETURN
2500 GOSUB 6500:VTAB 20:PRINT "ARE YOU SURE YOU WANT"
2510 PRINT "TO DELETE THIS ENTRY? ";
2520 GOSUB 9000:IF Z$ <> "Y" AND Z$ <> "N" THEN 2520
2530 PRINT Z$:IF Z$ = "N" THEN RETURN
2540 Z = RN(DN):IF DN = NR THEN 2580
2550 FOR X = DN TO NR-1:VA(X) = VA(X+1)
2560 RN(X) = RN(X+1):IT$(X,1) = IT$(X+1,1)
2570 IT$(X,2) = IT$(X+1,2):NEXT X
2580 IF Z$ = "E" THEN RETURN
2590 IF Z = NR THEN 2640
2600 REC = NR:GOSUB 11500:REC = Z:GOSUB 13000
2610 FOR X = 1 TO NR-1
2620 IF RN(X) = NR THEN RN(X) = Z:X = NR-1
2630 NEXT X
2640 NR = NR-1:IF NR = 0 THEN RETURN
2650 IF SI$ <> "" AND SS$ <> "" THEN GOSUB 12000:RETUR
N
2660 IF DN > NR THEN DN = NR
2670 REC = RN(DN):GOSUB 11500:RETURN
3000 GOSUB 6500:Q = RN(DN):GOSUB 2540:GOSUB 8000
3010 GOSUB 12500:REC = Q:GOSUB 13000:RETURN
3500 D = DN
3510 IF D = NR THEN PRINT G$;:RETURN
3520 D = D+1:SF = 0:IF SL <> 0 THEN IF LEFT$(IT$(D,2),
SL) = SS$ THEN SF = 1
3530 IF IT$(D,1) = SI$ OR (SS$ = "" AND SI$ = "") OR S
F THEN DN = D:REC = RN(DN):GOSUB 11500:RETURN
3540 GOTO 3510
4000 GOSUB 6500:SI$ = "":SS$ = "":VTAB 20
4010 PRINT "WHAT ITEM DO YOU WANT TO"
4020 INPUT "SEARCH FOR? ";T$:IF T$ = "" THEN RETURN
4030 IF LEN(T$) < 3 THEN T$ = T$+A1$
4040 FOR X = 1 TO 3:Z = ASC(MID$(T$,X,1))
4050 SI$ = SI$+CHR$(Z-32*(Z > 96)*(Z < 123)):NEXT X
4060 GOSUB 12000:RETURN
4500 GOSUB 6500:SI$ = "":SS$ = "":VTAB 20
4510 PRINT "WHAT LOCATION DO YOU"
4520 INPUT "WANT TO SEE? ";T$:IF T$ = "" THEN RETURN
4530 FOR X = 1 TO LEN(T$):Z = ASC(MID$(T$,X,1))
4540 SS$ = SS$+CHR$(Z-32*(Z > 96)*(Z < 123)):NEXT X
4550 SL = LEN(SS$):GOSUB 12000:RETURN
5000 GOSUB 6500:VTAB 16
5010 PRINT "PRESS <1> TO PRINT THIS RECORD OR"
5020 PRINT "PRESS <2> TO PRINT ENTIRE INVENTORY."
5030 GOSUB 9000:IF Z$ <> "1" AND Z$ <> "2" THEN 5030
5040 CH$ = Z$:PRINT
5050 PRINT "PRESS <Y> WHEN THE PRINTER IS READY OR"
5060 PRINT "ANY OTHER KEY TO CANCEL PRINTING."
5070 GOSUB 9000:IF Z$ <> "Y" THEN RETURN
5080 PRINT D$;"PR#1"
5090 IF CH$ = "1" THEN GOSUB 11000:GOTO 5180
5100 FOR P = 1 TO NR
5110 IF SI$ = "" AND SS$ = "" THEN 5150
5120 IF SL = 0 THEN 5140
5130 IF SS$ = LEFT$(IT$(P,2),SL) THEN 5150
5140 IF SI$ <> IT$(P,1) THEN 5160
5150 REC = RN(P):GOSUB 11500:GOSUB 11000:PRINT:PRINT
5160 NEXT P:PRINT "TOTAL VALUE: ",V
5170 REC = RN(DN):GOSUB 11500
5180 PRINT D$;"PR#0":RETURN
5500 GOSUB 6500:PRINT D$;"CLOSE ";F$;".RAF"
5510 PRINT D$;"OPEN";F$;".SEQ"
5520 PRINT D$;"WRITE";F$;".SEQ"
5530 PRINT NR:FOR X = 1 TO NR:PRINT IT$(X,1)
5540 PRINT IT$(X,2):PRINT RN(X):PRINT VA(X)
5550 NEXT X:IF FL OR NR = 500 THEN 5580
5560 FOR X = NR+1 TO NR+20:PRINT A1$:PRINT A2$
5570 PRINT 0:PRINT 0:NEXT X
5580 PRINT D$;"CLOSE ";F$;".SEQ":GOSUB 10500:RETURN
6000 PRINT:PRINT TAB(7);"PRESS ANY KEY TO CONTINUE."
6010 GOSUB 9000:RETURN
6500 VTAB 15:FOR X = 15 TO 21:PRINT BL$:NEXT X:RETURN
7000 HOME:PRINT "ITEMS: ";NR;
7010 IF SI$ <> "" OR SS$ <> "" THEN PRINT "*";
7020 HTAB 15:PRINT "TOTAL VALUE: ";V
7030 VTAB 23:PRINT "INVENTORY: ";F$;:RETURN
7500 HTAB 1:FOR X = 1 TO 10:VTAB RO(X)
7510 PRINT LB$(X);IN$(X);"<":NEXT X:RETURN
8000 CY = 1:MF = 0
8010 VTAB 21:HTAB 1:PRINT "MODE: ";MD$(MF)
8020 T$ = IN$(CY):CX = 1
8030 VTAB RO(CY):HTAB CO(CY)+CX
8040 GET K$:DK = 0:FOR L = 1 TO 7
8050 IF K$ = CK$(L) THEN DK = L:L = 7
8060 NEXT L:IF DK = 0 THEN 8180
8070 ON DK GOTO 8080,8080,8100,8100,8120,8120,8160
8080 DX = (DK = 2)-(DK = 1):IF (CX = 1 AND DX = -1) OR
 (CX = L(CY,1) AND DX = 1) THEN PRINT G$;:GOTO 8030
8090 CX = CX+DX:GOTO 8030
8100 IN$(CY) = T$:CY = CY+(DK = 4)-(DK = 3)
8110 CY = CY+((CY = 0)-(CY = 11))*10:GOTO 8020
8120 IF CX = 1 THEN PRINT G$;:GOTO 8030
8130 IF CX = 2 THEN T$ = MID$(T$,CX)+SP$:GOTO 8150
8140 T$ = LEFT$(T$,CX-2)+MID$(T$,CX)+SP$
8150 CX = CX-1:GOTO 8260
8160 MF = NOT MF:VTAB 21
8170 HTAB 7:PRINT MD$(MF):GOTO 8030
8180 IF K$ = CHR$(13) THEN IN$(CY) = T$:RETURN
8190 IF K$ < SP$ OR CX > L(CY,1) THEN PRINT G$;:GOTO 8
030
8200 IF NOT MF THEN 8230
8210 IF CX = 1 THEN T$ = K$+MID$(T$,2):GOTO 8250
8220 T$ = LEFT$(T$,CX-1)+K$+MID$(T$,CX+1):GOTO 8250
8230 IF CX = 1 THEN T$ = K$+LEFT$(T$,L(CY,1)-1):GOTO 8
250
8240 T$ = LEFT$(T$,CX-1)+K$+MID$(T$,CX,L(CY,1)-CX)
8250 CX = CX+1:CX = CX-(CX = L(CY,1)+1)
8260 VTAB RO(CY):HTAB CO(CY)+1:PRINT T$:GOTO 8030
8500 ELR = PEEK(218)+PEEK(219)*256:ERR = PEEK(222)
8510 HOME:PRINT
8520 PRINT "YOU HAVE ERROR NUMBER ";ERR;" IN LINE ";EL
R;"."
8530 PRINT:IF ERR <> 9 THEN 8590
8540 FL = 1:PRINT "THE DISK IS FULL.  COPY THIS FILE"
8550 PRINT "TO A NEW DISK IN ORDER TO CONTINUE."
8560 PRINT D$;"CLOSE ";F$;".RAF":GOSUB 6000
8570 IF NR = 0 THEN 130
8580 GOTO 430
8590 PRINT "PLEASE CHECK YOUR BASIC MANUAL FOR"
```

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```
8600 PRINT "A FURTHER EXPLANATION."
8610 GOSUB 6000:GOTO 130
9000 Z = PEEK(-16384)-128:IF Z < 0 THEN 9000
9010 POKE -16368,0:Z$ = CHR$(Z-32*(Z > 96)*(Z < 123))
9020 RETURN
9500 VTAB 1:HTAB 1:PRINT BL$:VTAB 18
9510 PRINT "PRESS <RETURN> ON THE ITEM LINE"
9520 PRINT "AFTER ENTERING THE LAST ITEM."
9530 FOR X = 1 TO 10:IN$(X) = LEFT$(BL$,L(X,1)):NEXT X
9540 NR = NR+1:IF NR = INT(NR/20) THEN GOSUB 5500
9550 IF NR < 501 THEN 9610
9560 HOME:NR = 500:PRINT
9570 PRINT "YOU HAVE REACHED THE LIMIT FOR THIS"
9580 PRINT "LIST.  IF YOU HAVE MORE ITEMS TO ADD,"
9590 PRINT "START A NEW LIST."
9600 GOSUB 6000:GOSUB 5500:RETURN
9610 DN = NR:GOSUB 7500:GOSUB 8000
9620 IF IN$(1) = LEFT$(BL$,30) THEN DN = 1:NR = NR-1:R
ETURN
9630 Q = NR:GOSUB 12500:REC = NR:GOSUB 13000:GOTO 9530
10500 PRINT:PRINT D$;"OPEN ";F$;".RAF,L186":RETURN
11000 FOR Y = 1 TO 10:PRINT LB$(Y);IN$(Y)
11010 NEXT Y:RETURN
11500 PRINT:PRINT D$;"READ ";F$;".RAF,R";REC
11510 INPUT RF$:PRINT D$
11520 FOR X = 1 TO 10:IN$(X) = MID$(RF$,L(X,2),L(X,1))
11530 NEXT X:RETURN
12000 GOSUB 6500:D = 0:FOR X = 1 TO NR
12010 SF = 0:IF SL <> 0 THEN IF SS$ = LEFT$(IT$(X,2),S
L) THEN SF = 1
12020 IF SI$ = IT$(X,1) OR SF THEN D = X:X = NR
12030 NEXT X
12040 IF D <> 0 THEN DN = D:REC = RN(DN):GOSUB 11500:R
ETURN
12050 GOSUB 6500:SI$ = "":SS$ = "":VTAB 16
12060 PRINT "SORRY, CAN'T FIND THAT ITEM OR LOCATION."
12070 GOSUB 6000:RETURN
12500 T$ = "":FOR X = 1 TO 3:Z = ASC(MID$(IN$(1),X,1))
12510 T$ = T$+CHR$(Z-32*(Z > 96)*(Z < 123)):NEXT X
12520 W = NR:IF W = 1 THEN 12590
12530 FOR X = 1 TO NR-1
12540 IF T$ < IT$(X,1) THEN W = X:X = NR-1
12550 NEXT X:IF W = NR THEN 12590
12560 FOR X = NR-1 TO W STEP -1:VA(X+1) = VA(X)
12570 IT$(X+1,1) = IT$(X,1):IT$(X+1,2) = IT$(X,2)
12580 RN(X+1) = RN(X):NEXT X
12590 IT$(W,1) = T$:VA(W) = VAL(IN$(6)):RN(W) = Q
12600 T$ = "":FOR X = 1 TO LEN(IN$(9))
12610 Z = ASC(MID$(IN$(9),X,1))
12620 T$ = T$+CHR$(Z-32*(Z > 96)*(Z < 123)):NEXT X
12630 IT$(W,2) = T$:DN = W:RETURN
13000 RF$ = "":FOR X = 1 TO 10:RF$ = RF$+IN$(X):NEXT X
13010 PRINT:PRINT D$;"WRITE ";F$;".RAF,R";REC
13020 PRINT RF$:PRINT D$:RETURN
13500 DATA 30,1,30,31,15,61,15,76,10,91,10
13510 DATA 101,10,111,10,121,25,131,30,156
14000 DATA ITEM,MAKE,MODEL NUMBER,SERIAL NUMBER,PRICE
14010 DATA VALUE,PURCHASE DATE,LENGTH OF WARRANTY
14020 DATA LOCATION,NOTE
14500 DATA 8,21,11,10,2,127,9
```

IBM PC & compatibles (printer optional)/ *Home Inventory Manager*

```
10 DEF SEG=&H40:IF (PEEK(&H10) AND 48)=32 THEN WIDTH 4
0
20 DEF SEG:KEY OFF:LOCATE ,,0:SCREEN 0:DEFINT A-U,W-Z
30 DIM CO(10),L(10),RN(1000),RO(10),VA(1000)
40 DIM IN$(10),IT$(1000,2),LB$(10),MD$(1),RF$(10)
50 FOR X=1 TO 10:READ RO(X),L(X):NEXT X
60 FOR X=1 TO 10:READ LB$:LB$(X)=LB$+": "
70 CO(X)=LEN(LB$(X)):NEXT X:BL$=STRING$(39,32):F$="":
80 MD$(0)="INSERT"+SP$+SP$:MD$(1)="OVERTYPE"
90 A1$=LEFT$(BL$,3):A2$=LEFT$(BL$,25):SL=0:DN=1
100 SP$=CHR$(32):ON ERROR GOTO 8500
110 SI$="":SS$="":VT=FRE(A$)
120 CLS:LOCATE 4,15:PRINT "Welcome to":LOCATE 6,9
130 PRINT "Home Inventory Manager":LOCATE 8,1
140 PRINT "Do you want to:":PRINT
150 PRINT "<S>tart a new inventory,"
160 PRINT "<U>se an existing inventory, or"
170 PRINT "<E>xit the program?"
180 GOSUB 9000:ON INSTR("SUE",Z$) GOTO 200,260,480
190 GOTO 180
200 CLS:LOCATE 6,1:INPUT "Enter name for new file: ",F
$
210 IF F$="" THEN 120
220 IF F$="?" THEN GOSUB 2000:GOTO 200
230 NR=0:GOSUB 10000:GOSUB 7000:GOSUB 9500
240 IF NR=0 THEN 340
250 DN=1:REC=RN(1):GOSUB 11000:GOTO 330
260 CLS:LOCATE 6,1:INPUT "Enter filename: ",F$
270 IF F$="" THEN 120
280 IF F$="?" THEN GOSUB 2000:GOTO 260
290 CLOSE:OPEN F$+".SEQ" FOR INPUT AS #1
300 INPUT#1,NR:FOR X=1 TO NR:INPUT#1,IT$(X,1)
310 INPUT#1,IT$(X,2):INPUT#1,RN(X):INPUT#1,VA(X):NEXT
X
320 CLOSE 1:GOSUB 10000:DN=1:REC=RN(1):GOSUB 11000
330 IF NR<>0 THEN 370
340 CLOSE:CLS:LOCATE 6,1
350 PRINT "There are no items in this file."
360 GOSUB 6000:GOTO 120
370 V=0:FOR X=1 TO NR:V=V+VA(X):NEXT X:GOSUB 7000
380 GOSUB 7500:LOCATE 15,1
390 PRINT "Choose from the following commands:"
400 PRINT "<A>dd, <B>ack, <C>atalog, <D>elete,"
410 PRINT "<E>dit, <F>orward, <I>tem, <L>ocation,"
420 PRINT "<P>rint, <Q>uit, or <S>ave."
430 LOCATE 21,1:PRINT BL$:LOCATE 21,1:PRINT "Command:
";
440 GOSUB 9000:PRINT Z$
450 IF INSTR("ABCDEFILPQS",Z$)=0 THEN SOUND 400,2:GOTO
 430
460 IF Z$="Q" THEN GOSUB 5500:CLOSE:GOTO 110
470 ON INSTR("ABCDEFILPS",Z$) GOSUB 1000,1500,2000,250
0,3000,3500,4000,4500,5000,5500:GOTO 330
480 IF NR<>0 THEN GOSUB 5500:CLOSE
490 CLS:KEY ON:ON ERROR GOTO 0:END
1000 GOSUB 6500:GOSUB 9500:REC=RN(1)
1010 GOSUB 11000:RETURN
1500 D=DN
1510 IF D=1 THEN SOUND 400,2:RETURN
1520 D=D-1:IF (SL<>0 AND LEFT$(IT$(D,2),SL)=SS$) OR IT
$(D,1)=SI$ OR (SI$="" AND SS$="") THEN DN=D:REC=RN(DN)
:GOSUB 11000:RETURN
1530 GOTO 1510
2000 CLS:LOCATE 6,1
2010 INPUT "What drive are the files in ";DR$
2020 IF DR$="" THEN CLS:FILES:PRINT:GOSUB 6000:RETURN
2030 IF RIGHT$(DR$,1)<>":" THEN DR$=LEFT$(DR$,1)+":"
2040 CLS:FILES DR$:PRINT:GOSUB 6000:RETURN
2500 GOSUB 6500:LOCATE 20,1
2510 PRINT "Are you sure you want"
2520 PRINT "to delete this entry? ";
2530 GOSUB 9000:IF Z$<>"Y" AND Z$<>"N" THEN 2530
2540 PRINT Z$:IF Z$="N" THEN RETURN
2550 Z=RN(DN):IF DN=NR THEN 2580
2560 FOR X=DN TO NR-1:VA(X)=VA(X+1):RN(X)=RN(X+1)
2570 IT$(X,1)=IT$(X+1,1):IT$(X,2)=IT$(X+1,2):NEXT X
2580 IF Z$="E" THEN RETURN
2590 IF Z=NR THEN 2630
2600 REC=NR:GOSUB 11000:REC=Z:GOSUB 12500
2610 FOR X=1 TO NR-1:IF RN(X)=NR THEN RN(X)=Z:X=NR-1
2620 NEXT X
2630 NR=NR-1:IF NR=0 THEN RETURN
2640 IF SI$<>"" AND SS$<>"" THEN GOSUB 11500:RETURN
```

```
2650 IF DN>NR THEN DN=NR
2660 REC=RN(DN):GOSUB 11000:RETURN
3000 GOSUB 6500:Q=RN(DN):GOSUB 2550:GOSUB 8000
3010 GOSUB 12000:REC=Q:GOSUB 12500:RETURN
3500 D=DN
3510 IF D=NR THEN SOUND 400,2:RETURN
3520 D=D+1:IF (SL<>0 AND LEFT$(IT$(D,2),SL)=SS$) OR IT
$(D,1)=SI$ OR (SS$="" AND SI$="") THEN DN=D:REC=RN(DN)
:GOSUB 11000:RETURN
3530 GOTO 3510
4000 GOSUB 6500:SI$="":SS$="":LOCATE 20,1
4010 PRINT "What item do you want to"
4020 INPUT "search for? ",T$:IF T$="" THEN RETURN
4030 IF LEN(T$)<3 THEN T$=T$+A1$
4040 FOR X=1 TO 3:Z=ASC(MID$(T$,X,1))
4050 SI$=SI$+CHR$(Z-32*(Z>96)*(Z<123)):NEXT X
4060 GOSUB 11500:RETURN
4500 GOSUB 6500:SI$="":SS$="":LOCATE 20,1
4510 PRINT "What location do you"
4520 INPUT "want to see? ",T$:IF T$="" THEN RETURN
4530 FOR X=1 TO LEN(T$):Z=ASC(MID$(T$,X,1))
4540 SS$=SS$+CHR$(Z-32*(Z>96)*(Z<123)):NEXT X
4550 SL=LEN(SS$):GOSUB 11500:RETURN
5000 GOSUB 6500:LOCATE 16,1
5010 PRINT "Press <1> to print this record or"
5020 PRINT "press <2> to print entire inventory."
5030 GOSUB 9000:IF Z$<>"1" AND Z$<>"2" THEN 5030
5040 CH$=Z$:PRINT
5050 PRINT "Press <Y> when the printer is ready or"
5060 PRINT "any other key to cancel printing.";
5070 GOSUB 9000:PRINT Z$:IF Z$<>"Y" THEN RETURN
5080 IF CH$="1" THEN GOSUB 10500:RETURN
5090 FOR P=1 TO NR:IF SI$="" AND SS$="" THEN 5110
5100 IF SI$<>IT$(P,1) AND SS$<>LEFT$(IT$(P,2),SL) THEN
 5120
5110 REC=RN(P):GOSUB 11000:GOSUB 10500:LPRINT:LPRINT
5120 NEXT P:LPRINT "Total Value: ",V:REC=RN(DN)
5130 GOSUB 11000:RETURN
5500 GOSUB 6500:OPEN F$+".SEQ" FOR OUTPUT AS #1
5510 WRITE#1,NR:FOR X=1 TO NR:WRITE#1,IT$(X,1)
5520 WRITE#1,IT$(X,2):WRITE#1,RN(X):WRITE#1,VA(X)
5530 NEXT X:IF FL OR NR=1000 THEN CLOSE 1:RETURN
5540 FOR X=NR+1 TO NR+20:WRITE#1,A1$:WRITE#1,A2$
5550 WRITE#1,0:WRITE#1,0:NEXT X:CLOSE 1:RETURN
6000 PRINT:PRINT TAB(7);"Press any key to continue."
6010 GOSUB 9000:RETURN
6500 LOCATE 15,1:FOR X=15 TO 21:PRINT BL$:NEXT X:RETUR
N
7000 CLS:LOCATE 25,1:PRINT "Inventory: ";F$;
7010 LOCATE 1,1:PRINT "Items:";NR;
7020 IF SI$="" AND SS$="" THEN PRINT:ELSE PRINT "*"
7030 LOCATE 1,21:PRINT "Total Value:";V;:RETURN
7500 FOR X=1 TO 10:LOCATE RO(X),1
7510 PRINT LB$(X);IN$(X);CHR$(17):NEXT X:RETURN
8000 CY=1:MF=0:LOCATE 21,1:PRINT "MODE: ";MD$(ABS(MF))
;
8010 T$=IN$(CY):CX=1
8020 LOCATE RO(CY),CO(CY)+CX:PRINT CHR$(219)
8030 LOCATE RO(CY),CO(CY)+CX:PRINT MID$(T$,CX,1)
8040 K$=INKEY$:IF K$="" THEN 8020
8050 IF LEN(K$)=1 THEN 8130
8060 DK=INSTR("KMHPR",RIGHT$(K$,1))
8070 IF DK=0 THEN SOUND 400,2:GOTO 8020
8080 ON DK GOTO 8090,8090,8100,8100,8120
8090 DX=(DK=1)-(DK=2):IF (CX=1 AND DX=-1) OR (CX=L(CY)
 AND DX=1) THEN SOUND 400,2:GOTO 8020 ELSE CX=CX+DX:GO
TO 8020
8100 IN$(CY)=T$:CY=CY+(DK=3)-(DK=4)
8110 CY=CY+((CY=11)-(CY=0))*10:GOTO 8010
8120 MF=NOT MF:LOCATE 21,7:PRINT MD$(ABS(MF)):GOTO 802
0
8130 IF K$=CHR$(13) THEN IN$(CY)=T$:RETURN
8140 IF K$<>CHR$(8) THEN 8180
8150 IF CX=1 THEN SOUND 400,4:GOTO 8020
8160 T$=LEFT$(T$,CX-2)+MID$(T$,CX)+SP$
8170 CX=CX-1:GOTO 8220
8180 IF K$<SP$ OR CX>L(CY) THEN SOUND 400,2:GOTO 8020
8190 IF MF THEN MID$(T$,CX,1)=K$:GOTO 8210
8200 T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX,L(CY)-CX)
8210 CX=CX+1:CX=CX+(CX=L(CY)+1)
8220 LOCATE RO(CY),CO(CY)+1:PRINT T$:GOTO 8020
8500 CLS:LOCATE 6,1
8510 PRINT "You have error number";ERR;"in line";ERL
8520 IF ERR<>61 THEN 8570
8530 FL=-1:PRINT "The disk is full.  Copy this file"
8540 PRINT "to a new disk in order to continue."
8550 CLOSE:GOSUB 6000
8560 IF NR=0 THEN RESUME 120 ELSE RESUME 370
8570 IF ERR<>25 THEN 8600
8580 PRINT "The printer is not ready.":GOSUB 6000
8590 REC=RN(DN):GOSUB 11000:RESUME 370
8600 PRINT "Please check your BASIC manual for"
8610 PRINT "a further explanation."
8620 GOSUB 6000:RESUME 120
9000 Z$=INKEY$:IF Z$="" THEN 9000
9010 Z=ASC(Z$):Z$=CHR$(Z-32*(Z>96)*(Z<123)):RETURN
9500 LOCATE 1,1:PRINT BL$:LOCATE 18,1
9510 PRINT "Press <ENTER> on the Item line"
9520 PRINT "after entering the last item."
9530 FOR X=1 TO 10:IN$(X)=STRING$(L(X),32):NEXT X
9540 NR=NR+1:IF NR=INT(NR/20) THEN GOSUB 5500
9550 IF NR<1001 THEN 9600
9560 CLS:NR=1000:LOCATE 6,1
9570 PRINT "You have reached the limit for this"
9580 PRINT "list.  If you have more items to add,"
9590 PRINT "start a new list.":GOSUB 6000:GOSUB 5500:R
ETURN
9600 DN=NR:GOSUB 7500:GOSUB 8000
9610 IF IN$(1)=STRING$(30,32) THEN DN=1:NR=NR-1:RETURN
9620 Q=NR:GOSUB 12000:REC=NR:GOSUB 12500:GOTO 9530
10000 OPEN "R",#2,F$+".RAF"
10010 FIELD #2,30 AS RF$(1),30 AS RF$(2),15 AS RF$(3),
15 AS RF$(4),10 AS RF$(5),10 AS RF$(6),10 AS RF$(7)
10020 OPEN "R",#3,F$+".RAF"
10030 FIELD #3,10 AS RF$(8),25 AS RF$(9),30 AS RF$(10)
10040 RETURN
10500 FOR Y=1 TO 10:LPRINT LB$(Y);IN$(Y):NEXT Y:RETURN
11000 GET #2,2*REC-1:FOR X=1 TO 7:IN$(X)=RF$(X):NEXT X
11010 GET #3,2*REC:FOR X=8 TO 10:IN$(X)=RF$(X):NEXT X
11020 RETURN
11500 GOSUB 6500:D=0:FOR X=1 TO NR
11510 IF SI$=IT$(X,1) OR (SL<>0 AND SS$=LEFT$(IT$(X,2)
,SL)) THEN D=X:X=NR
11520 NEXT X:IF D<>0 THEN DN=D:REC=RN(DN):GOSUB 11000:
RETURN
11530 GOSUB 6500:SI$="":SS$="":LOCATE 16,1
11540 PRINT "Sorry, can't find that item or location."
11550 GOSUB 6000:RETURN
12000 T$="":FOR X=1 TO 3:Z=ASC(MID$(IN$(1),X,1))
12010 T$=T$+CHR$(Z-32*(Z>96)*(Z<123)):NEXT X
12020 W=NR:IF W=1 THEN 12080
12030 FOR X=1 TO NR-1:IF T$<IT$(X,1) THEN W=X:X=NR-1
12040 NEXT X:IF W=NR THEN 12080
12050 FOR X=NR-1 TO W STEP -1:VA(X+1)=VA(X)
12060 IT$(X+1,1)=IT$(X,1):IT$(X+1,2)=IT$(X,2)
12070 RN(X+1)=RN(X):NEXT X
12080 IT$(W,1)=T$:VA(W)=VAL(IN$(6)):RN(W)=Q:T$=""
12090 FOR X=1 TO LEN(IN$(9)):Z=ASC(MID$(IN$(9),X,1))
12100 T$=T$+CHR$(Z-32*(Z>96)*(Z<123)):NEXT X
12110 IT$(W,2)=T$:DN=W:RETURN
12500 FOR X=1 TO 7:LSET RF$(X)=IN$(X):NEXT X:PUT #2,2*
REC-1
12510 FOR X=8 TO 10:LSET RF$(X)=IN$(X):NEXT X:PUT #3,2
*REC
12520 RETURN
13000 DATA 3,30,4,30,5,15,6,15,7,10,8,10,9,10,10,10,11
13010 DATA 25,12,30
13500 DATA ITEM,MAKE,MODEL NUMBER,SERIAL NUMBER,PRICE
```

```
13510 DATA VALUE,PURCHASE DATE,LENGTH OF WARRANTY
13520 DATA LOCATION,NOTE
```

Macintosh (printer optional)/ *Home Inventory Manager*

```
10 DIM CO(10),L(10),RN(1000),RO(10),VA(1000)
20 DIM IN$(10),IT$(1000,2),LB$(10),MD$(1),RF$(10)
30 WIDTH 85:CALL TEXTFONT(4):CALL TEXTSIZE(9):CALL TEX
TMODE(0)
40 WINDOW 1,"HOME INVENTORY MANAGER",(0,38)-(527,338)
50 FOR X=1 TO 10:READ RO(X),L(X):NEXT X
60 FOR X=1 TO 10:READ LB$:LB$(X)=LB$+": "
70 CO(X)=LEN(LB$(X)):NEXT X:CK$=""
80 FOR X=1 TO 12:READ T:CK$=CK$+CHR$(T):NEXT X
90 BL$=STRING$(39,32):F$="":SP$=CHR$(32)
100 MD$(0)="INSERT"+SP$+SP$:MD$(1)="OVERTYPE"
110 A1$=LEFT$(BL$,3):A2$=LEFT$(BL$,25):SL=0:DN=1
120 ON ERROR GOTO 8000
130 SI$="":SS$="":VT=FRE(A$)
140 CLS:LOCATE 4,15:PRINT "Welcome to":LOCATE 6,9
150 PRINT "Home Inventory Manager":LOCATE 8,1
160 PRINT "Do you want to:":PRINT
170 PRINT "<S>tart a new inventory,"
180 PRINT "<U>se an existing inventory, or"
190 PRINT "<E>xit the program?"
200 GOSUB 8500:ON INSTR("SUE",Z$) GOTO 210,260,480:GOT
O 200
210 CLS:PRINT:INPUT "Enter name for new file: ",F$
220 IF F$="" THEN 140
230 NR=0:GOSUB 9500:GOSUB 6500:GOSUB 9000
240 IF NR=0 THEN 340
250 DN=1:REC=RN(1):GOSUB 10500:GOTO 330
260 CLS:LOCATE 6,1:INPUT "Enter filename: ",F$
270 IF F$="" THEN 140
280 CLOSE:OPEN F$+".SEQ" FOR INPUT AS #1
290 INPUT#1,NR:FOR X=1 TO NR:INPUT#1,IT$(X,1)
300 INPUT#1,IT$(X,2):INPUT#1,RN(X):INPUT#1,VA(X)
310 NEXT X:CLOSE 1:GOSUB 9500:REC=RN(1):GOSUB 10500
320 DN=1
330 IF NR<>0 THEN 370
340 CLOSE:CLS:LOCATE 6,1
350 PRINT "There are no items in this file."
360 GOSUB 5500:GOTO 140
370 V=0:FOR X=1 TO NR:V=V+VA(X):NEXT X:GOSUB 6500
380 GOSUB 7000:LOCATE 15,1
390 PRINT "Choose from the following commands:"
400 PRINT "<A>dd, <B>ack, <D>elete, <E>dit,"
410 PRINT "<F>orward, <I>tem, <L>ocation,"
420 PRINT "<P>rint, <Q>uit, or <S>ave."
430 LOCATE 21,1:PRINT BL$:LOCATE 21,1:PRINT "Command:
";
440 GOSUB 8500:PRINT Z$
450 IF INSTR("ABDEFILPQS",Z$)=0 THEN SOUND 250,2:GOTO
430
460 IF Z$="Q" THEN GOSUB 5000:CLOSE:GOTO 130
470 ON INSTR("ABDEFILPS",Z$) GOSUB 1000,1500,2000,2500
,3000,3500,4000,4500,5000:GOTO 330
480 IF NR<>0 THEN GOSUB 5000:CLOSE
490 CLS:ON ERROR GOTO 0:END
1000 GOSUB 6000:GOSUB 9000:REC=RN(1):GOSUB 10500:RETUR
N
1500 D=DN
1510 IF D=1 THEN SOUND 250,2:RETURN
1520 D=D-1:IF (SL<>0 AND LEFT$(IT$(D,2),SL)=SS$) OR IT
$(D,1)=SI$ OR (SI$="" AND SS$=""") THEN DN=D:REC=RN(DN)
:GOSUB 10500:RETURN
1530 GOTO 1510
2000 GOSUB 6000:LOCATE 20,1
2010 PRINT "Are you sure you want"
2020 PRINT "to delete this entry? ";
2030 GOSUB 8500:IF Z$<>"Y" AND Z$<>"N" THEN 2030
2040 PRINT Z$:IF Z$="N" THEN RETURN
2050 Z=RN(DN):IF DN=NR THEN 2080
2060 FOR X=DN TO NR-1:VA(X)=VA(X+1):RN(X)=RN(X+1)
2070 IT$(X,1)=IT$(X+1,1):IT$(X,2)=IT$(X+1,2):NEXT X
2080 IF Z$="E" THEN RETURN
2090 IF Z=NR THEN 2130
2100 REC=NR:GOSUB 10500:REC=Z:GOSUB 12000
2110 FOR X=1 TO NR-1:IF RN(X)=NR THEN RN(X)=Z:X=NR-1
2120 NEXT X
2130 NR=NR-1:IF SI$<>"" AND SS$<>"" THEN GOSUB 11000:R
ETURN
2140 IF DN>NR THEN DN=NR
2150 IF NR=0 THEN RETURN
2160 REC=RN(DN):GOSUB 10500:RETURN
2500 GOSUB 6000:Q=RN(DN):GOSUB 2050:GOSUB 7500
2510 GOSUB 11500:REC=Q:GOSUB 12000:RETURN
3000 D=DN
3010 IF D=NR THEN SOUND 250,2:RETURN
3020 D=D+1:IF (SL<>0 AND LEFT$(IT$(D,2),SL)=SS$) OR IT
$(D,1)=SI$ OR (SS$="" AND SI$="") THEN DN=D:REC=RN(DN)
:GOSUB 10500:RETURN
3030 GOTO 3010
3500 GOSUB 6000:SI$="":SS$="":LOCATE 20,1
3510 PRINT "What item do you want to"
3520 INPUT "search for? ",T$:IF T$="" THEN RETURN
3530 IF LEN(T$)<3 THEN T$=T$+A1$
3540 FOR X=1 TO 3:Z=ASC(MID$(T$,X,1))
3550 SI$=SI$+CHR$(Z-32*(Z>96)*(Z<123)):NEXT X
3560 GOSUB 11000:RETURN
4000 GOSUB 6000:SI$="":SS$="":LOCATE 20,1
4010 PRINT "What location do you"
4020 INPUT "want to see? ",T$:IF T$="" THEN RETURN
4030 FOR X=1 TO LEN(T$):Z=ASC(MID$(T$,X,1))
4040 SS$=SS$+CHR$(Z-32*(Z>96)*(Z<123)):NEXT X
4050 SL=LEN(SS$):GOSUB 11000:RETURN
4500 GOSUB 6000:LOCATE 16,1
4510 PRINT "Press <1> to print this record or"
4520 PRINT "press <2> to print entire inventory."
4530 GOSUB 8500:IF Z$<>"1" AND Z$<>"2" THEN 4530
4540 CH$=Z$:PRINT
4550 PRINT "Press <Y> when the printer is ready or"
4560 PRINT "any other key to cancel printing.";
4570 GOSUB 8500:PRINT Z$:IF Z$<>"Y" THEN RETURN
4580 IF CH$="1" THEN GOSUB 10000:RETURN
4590 FOR P=1 TO NR:IF SI$="" AND SS$="" THEN 4610
4600 IF SI$<>IT$(P,1) AND SS$<>LEFT$(IT$(P,2),SL) THEN
 4620
4610 REC=RN(P):GOSUB 10500:GOSUB 10000:LPRINT:LPRINT
4620 NEXT P:LPRINT "Total Value: ",V:REC=RN(DN)
4630 GOSUB 10500:RETURN
5000 GOSUB 6000:OPEN F$+".SEQ" FOR OUTPUT AS #1
5010 WRITE#1,NR:FOR X=1 TO NR:WRITE#1,IT$(X,1)
5020 WRITE#1,IT$(X,2):WRITE#1,RN(X):WRITE#1,VA(X)
5030 NEXT X:IF FL OR NR=1000 THEN CLOSE 1:RETURN
5040 FOR X=NR+1 TO NR+20:WRITE#1,A1$:WRITE#1,A2$
5050 WRITE#1,0:WRITE#1,0:NEXT X:CLOSE 1:RETURN
5500 PRINT:PRINT TAB(7);"Press any key to continue."
5510 GOSUB 8500:RETURN
6000 LOCATE 15,1:FOR X=15 TO 21:PRINT BL$:NEXT X:RETUR
N
6500 CLS:LOCATE 25,1:PRINT "Inventory: ";F$;
6510 LOCATE 1,1:PRINT "Items:";NR;
6520 IF SI$="" AND SS$="" THEN PRINT:ELSE PRINT "*"
6530 LOCATE 1,21:PRINT "Total Value:";V;:RETURN
7000 FOR X=1 TO 10:LOCATE RO(X),1
7010 PRINT LB$(X);IN$(X);"<":NEXT X:RETURN
7500 CY=1:MF=0:LOCATE 21,1:PRINT "MODE: ";MD$(ABS(MF))
7510 T$=IN$(CY):CX=1
7520 CALL TEXTMODE(2)
7530 LOCATE RO(CY),CO(CY)+CX:PRINT MID$(T$,CX,1)
7540 LOCATE RO(CY),CO(CY)+CX:PRINT " "
7550 LOCATE RO(CY),CO(CY)+CX:PRINT "_"
7560 LOCATE RO(CY),CO(CY)+CX:PRINT MID$(T$,CX,1)
7570 CALL TEXTMODE(0)
7580 K$=INKEY$:IF K$="" THEN 7520
```

```
7590 DK=INSTR(CK$,K$):IF DK=0 THEN 7700
7600 IF DK=0 THEN SOUND 250,2:GOTO 7520
7610 IF DK>6 THEN DK=DK-6
7620 ON DK GOTO 7630,7630,7640,7640,7660,7690
7630 DX=(DK=1)-(DK=2):IF (CX=1 AND DX=-1) OR (CX=L(CY)
 AND DX=1) THEN SOUND 250,2:GOTO 7520 ELSE CX=CX+DX:GO
TO 7520
7640 IN$(CY)=T$:CY=CY+(DK=3)-(DK=4)
7650 CY=CY+((CY=11)-(CY=0))*10:GOTO 7510
7660 IF CX=1 THEN SOUND 400,4:GOTO 7520
7670 T$=LEFT$(T$,CX-2)+MID$(T$,CX)+SP$
7680 CX=CX-1:GOTO 7750
7690 MF=NOT MF:LOCATE 21,7:PRINT MD$(ABS(MF)):GOTO 752
0
7700 IF K$=CHR$(13) THEN IN$(CY)=T$:RETURN
7710 IF K$<SP$ OR CX>L(CY) THEN SOUND 250,2:GOTO 7520
7720 IF MF THEN MID$(T$,CX,1)=K$:GOTO 7740
7730 T$=LEFT$(T$,CX-1)+K$+MID$(T$,CX,L(CY)-CX)
7740 CX=CX+1:CX=CX+(CX=L(CY)+1)
7750 LOCATE RO(CY),CO(CY)+1:PRINT T$;"<":GOTO 7520
8000 CLS:LOCATE 6,1
8010 PRINT "You have error number";ERR;"in line";ERL
8020 IF ERR<>61 THEN 8070
8030 FL=-1:PRINT "The disk is full.  Copy this file"
8040 PRINT "to a new disk in order to continue."
8050 CLOSE:GOSUB 5500
8060 IF NR=0 THEN RESUME 140 ELSE RESUME 370
8070 PRINT "Please check your BASIC manual for"
8080 PRINT "a further explanation."
8090 GOSUB 5500:RESUME 140
8500 Z$=INKEY$:IF Z$="" THEN 8500
8510 Z=ASC(Z$):Z$=CHR$(Z-32*(Z>96)*(Z<123)):RETURN
9000 LOCATE 1,1:PRINT BL$:LOCATE 18,1
9010 PRINT "Press <RETURN> on the Item line"
9020 PRINT "after entering the last item."
9030 FOR X=1 TO 10:IN$(X)=STRING$(L(X),32):NEXT X
9040 NR=NR+1:IF NR=INT(NR/20) THEN GOSUB 5000
9050 IF NR<1001 THEN 9100
9060 CLS:NR=1000:LOCATE 6,1
9070 PRINT "You have reached the limit for this"
9080 PRINT "list.  If you have more items to add,"
9090 PRINT "start a new list.":GOSUB 5500:GOSUB 5000:R
ETURN
9100 DN=NR:GOSUB 7000:GOSUB 7500
9110 IF IN$(1)=STRING$(30,32) THEN DN=1:NR=NR-1:RETURN
9120 Q=NR:GOSUB 11500:REC=NR:GOSUB 12000:GOTO 9030
9500 OPEN "R",#2,F$+".RAF",185
9510 FIELD #2,30 AS RF$(1),30 AS RF$(2),15 AS RF$(3),1
5 AS RF$(4),10 AS RF$(5),10 AS RF$(6),10 AS RF$(7),10
AS RF$(8),25 AS RF$(9),30 AS RF$(10)
9520 RETURN
10000 FOR Y=1 TO 10:LPRINT LB$(Y);IN$(Y):NEXT Y:RETURN
10500 GET #2,REC:FOR X=1 TO 10:IN$(X)=RF$(X):NEXT X
10510 RETURN
11000 GOSUB 6000:D=0:FOR X=1 TO NR
11010 IF SI$=IT$(X,1) OR (SL<>0 AND SS$=LEFT$(IT$(X,2)
,SL)) THEN D=X:X=NR
11020 NEXT X:IF D<>0 THEN DN=D:REC=RN(DN):GOSUB 10500:
RETURN
11030 SI$="":SS$="":LOCATE 16,1
11040 PRINT "Sorry, can't find that item or location."
11050 GOSUB 5500:RETURN
11500 T$="":FOR X=1 TO 3:Z=ASC(MID$(IN$(1),X,1))
11510 T$=T$+CHR$(Z-32*(Z>96)*(Z<123)):NEXT X
11520 W=NR:IF W=1 THEN 11580
11530 FOR X=1 TO NR-1:IF T$<IT$(X,1) THEN W=X:X=NR-1
11540 NEXT X:IF W=NR THEN 11580
11550 FOR X=NR-1 TO W STEP -1:VA(X+1)=VA(X)
11560 IT$(X+1,1)=IT$(X,1):IT$(X+1,2)=IT$(X,2)
11570 RN(X+1)=RN(X):NEXT X
11580 IT$(W,1)=T$:VA(W)=VAL(IN$(6)):RN(W)=Q:T$=""
11590 FOR X=1 TO LEN(IN$(9)):Z=ASC(MID$(IN$(9),X,1))
11600 T$=T$+CHR$(Z-32*(Z>96)*(Z<123)):NEXT X
11610 IT$(W,2)=T$:DN=W:RETURN
```


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CIRCLE READER SERVICE 31

```
12000 FOR X=1 TO 10:LSET RF$(X)=IN$(X):NEXT X:PUT #2,R
EC
12010 RETURN
12500 DATA 3,30,4,30,5,15,6,15,7,10,8,10,9,10,10,10,11
12510 DATA 25,12,30
13000 DATA ITEM,MAKE,MODEL NUMBER,SERIAL NUMBER,PRICE
13010 DATA VALUE,PURCHASE DATE,LENGTH OF WARRANTY
13020 DATA LOCATION,NOTE
13500 DATA 140,182,183,167,8,94,129,235,227,234,8,233
```

MODIFICATION FOR ANOTHER COMPUTER

Apple II series w/ProDOS (printer optional)/ *Home Inventory Manager*

Use the Apple II series version, except change lines 2020 and 2040 to read as follows:

```
2020 IF DR$ = "" THEN HOME:PRINT D$;"CAT":PRINT:GOSUB
6000:RETURN
2040 HOME:PRINT D$;"CAT";DR$:PRINT
```

TIPS TO THE TYPIST

SOME GENERAL RULES

1. Read instructions and program headings carefully.

2. Don't let fatigue and boredom contribute to inaccuracy. If you're new to programming, type in a longer program in easy stages, SAVEing each installment as you go.

3. Assume that every character in a program listing must be copied accurately if a program is to work.

4. Watch out for potential trouble spots. About 90 percent of all typing errors occur in DATA statements.

5. Be aware that our program listings are printed 54 characters wide. Thus, a single BASIC program "line" (sometimes called a "logical line") may appear as several lines in our listing. If you are typing along and reach the right margin of the printed listing, don't press RETURN or ENTER before checking to see if the program "line" you're typing really ends there.

6. To correct an error in a BASIC program line, type the line in again from the beginning, and press RETURN or ENTER to replace the old line.

DEBUGGING HINTS

1. Write down any error messages you receive.

2. Look up error messages in your manual, and check the indicated lines for simple mistakes. Also check related lines, such as the DATA statements corresponding to a READ routine. Correct all the problems you can find, and SAVE a corrected copy of the program before typing RUN again.

3. LIST the program in screen-size chunks (check your manual for instructions on how to LIST parts of a program) or get a printout. Compare what you've typed in—letter by letter—to the published program. Make sure that you haven't dropped or mixed up some punctuation, switched uppercase text for lowercase, or vice versa, or miscounted the characters (and/or spaces) between a pair of quotes.

4. Mistakes in DATA statements are the single most common cause of program failures. If you can't find your error in the lines the computer specifies, check your DATA statements line by line, letter by letter, comma by comma.

5. If all else fails, turn off your computer and relax. Then try again the next day—exhausted proofreaders are careless proofreaders.

GHOSTSITTER

BY JOEY LATIMER

It's Halloween night and the older ghosts have all gone out haunting, leaving you in the care of Orc, the new robot ghost-sitter. Orc is supposed to make sure that you don't touch the large cauldron or upset the contents of the house in any way while the other ghosts are gone. Disappointed that you couldn't go on the haunt, you decide to have a little fun on your own. "Let's see how good this Orc really is," you say as you whisk up to the attic with your "ghost cart." Vroooooooom!

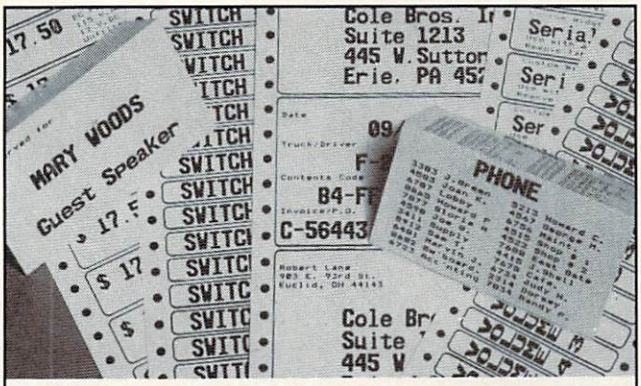
PLAYING THE *GHOSTSITTER* GAME

Type the *Ghostsitter* program listing into your computer, SAVE it, then RUN it. If all goes well, you will find your "ghost cart" scooting in the direction of the elevator. When the car comes out of the elevator, you can make it go left by pressing the "B" key. Pressing "N" makes the car go right, while pressing "Z" lets the car glide over holes in the floors. You are trying to disrupt things in the house, so when you run into an object such as a trunk, a broom, a bag, or a pumpkin, it relocates to another location on the same floor of the house and you collect points. However, running into the cauldron or Orc will put an immediate end to your fun.

IBM PC & compatibles/*Ghostsitter*

```
10 DEF SEG=0:RANDOMIZE TIMER
20 DIM A(12),B(12),BROOM(6),C(12),CAUL(9),CP(6,2)
30 DIM D(12),LCAR(24),LP(4),ORC(8),P(6),PUMP(8)
40 DIM RCAR(24),RP(4),SACK(6),TRUNK(8)
50 HS=0:KEY OFF:SCREEN 1,0:COLOR 0,2:LOCATE ,,0
60 FOR X=1 TO 6:FOR Y=1 TO 2:READ CP(X,Y):NEXT Y,X
70 FOR X=1 TO 12:READ A(X),B(X),C(X),D(X):NEXT X
80 FOR X=1 TO 4:READ LP(X),RP(X):NEXT X
90 GOSUB 1000:GET (1,1)-(7,9),BROOM
100 GOSUB 1000:GET (1,1)-(9,9),PUMP
110 GOSUB 1000:GET (1,1)-(13,8),CAUL
120 GOSUB 1000:GET (1,1)-(9,9),ORC
130 GOSUB 1000:GET (1,1)-(8,9),SACK
140 GOSUB 1000:GET (1,1)-(9,9),TRUNK
150 E$="D1R1U1L1":W$="C2D2R1D1R2U1R1U2L1U1L2D2C0R2"
160 G$="U5R1U1R1U1R6D1R1D1R1D5":W$=W$+"BM+8,-1;"+W$
170 CLS:READ B$:PSET (19,8),3
180 DRAW "XB$;C1XG$;D1BM10,4;XE$;BM6,12;XW$;"
190 GET (1,1)-(24,15),LCAR:CLS:READ B$:PSET (6,8),3
200 DRAW "XB$;C1U1XG$;BM14,4;XE$;BM4,12;XW$;"
210 GET (1,1)-(24,15),RCAR
220 CLS:DRAW "C1BM0,158;R319BM20,33C2D123R240C0U27"
230 DRAW "C2U116C1BM262,13;D117C0D26C1R37U140R2C2D140"
240 FOR X=1 TO 12:LINE (A(X),B(X))-(C(X),D(X)):NEXT X
250 P(1)=100:P(2)=220:P(3)=59:P(4)=105
260 PX=30:Q1=22:Q2=140:PUT (Q1,Q2),ORC:DF=15
270 LC=4:MPDROP=0:RC=4:SC=0:TEST=-1:FOR LVL=1 TO 4
280 GOSUB 2000:NEXT LVL:LOCATE 1,4:PRINT "THE"
```

```
290 PRINT "GHOSTSITTER":PRINT TAB(3);"GAME"
300 LOCATE 22,14:PRINT "SCORE:":LOCATE 23,3
310 PRINT "<B>=LEFT <N>=RIGHT <Z>=GLIDE OVER HOLES";
320 LOCATE 22,20:PRINT SC
330 FOR X=PX TO 265 STEP 6:PUT (X,140),RCAR
340 PUT (X,140),RCAR:NEXT X:FL=0:LVL=1
350 FOR Y=140 TO 36 STEP -3:PUT (270,Y),RCAR
360 SOUND 300-Y,.5:PUT (270,Y),RCAR:NEXT Y
370 FOR X=270 TO 232 STEP -3:PUT (X,33),LCAR
380 PUT (X,33),LCAR:NEXT X:PX=232
390 PY=33:TY=46:PUT (CP(RC,1),CP(RC,2)),CAUL
400 K$=INKEY$:POKE 1050,PEEK(1052)
410 IF K$="B" OR K$="b" THEN FL=0
420 IF K$="N" OR K$="n" THEN FL=-1
430 MPDROP=0:IF K$="Z" OR K$="z" THEN MPDROP=1
440 IF FL THEN PUT(PX,PY),RCAR ELSE PUT (PX,PY),LCAR
450 PUT (Q1,Q2),ORC:Q1=Q1-DF*((PX>Q1)-(PX<Q1))/15
460 Q2=Q2-DF*((PY>Q2)-(PY<Q2))/15:PUT (Q1,Q2),ORC
470 IF POINT(PX+5,PY+4)=1 OR POINT(PX+12,PY-1)=1 OR PO
INT(PX+12,PY+5)=1 OR POINT
(PX+18,PY+4)=1 THEN 760
480 TEST=POINT(PX+2,PY+15)+POINT(PX+21,PY+15)
490 IF FL THEN 530
500 IF POINT(PX+1,PY+8)=1 OR POINT(PX+24,PY+8)=1 THEN
760
510 HIT=(POINT(PX-1,TY) OR POINT(PX+3,TY) OR POINT(PX+
11,TY) OR POINT(PX+14,TY)
OR POINT(PX+21,TY))
520 GOTO 550
530 IF POINT(PX-1,PY+8)=1 OR POINT(PX+22,PY+8)=1 THEN
760
540 HIT=(POINT(PX+24,TY) OR POINT(PX+20,TY) OR POINT(P
X+12,TY) OR POINT(PX+9,TY)
 OR POINT(PX+2,TY))
550 IF HIT=1 THEN 760
560 IF HIT=0 THEN 620
570 SOUND 100,2:GOSUB 2000
580 T=INT(RND*225)+25
590 IF T>LP(LVL) AND T<RP(LVL) THEN 580
600 P(LVL)=T:GOSUB 2000
610 SC=SC+HIT*50:LOCATE 22,20:PRINT SC
620 IF FL THEN PUT(PX,PY),RCAR ELSE PUT (PX,PY),LCAR
630 IF TEST<>0 OR MPDROP<>0 THEN 680
640 FOR Y=PY TO PY+26 STEP 3:SOUND 300-Y,.2
650 IF FL THEN PUT (PX,Y),RCAR:PUT (PX,Y),RCAR:GOTO 67
0
660 PUT (PX,Y),LCAR:PUT (PX,Y),LCAR
670 NEXT Y:PY=PY+27:TY=PY+13:LVL=LVL+1
680 IF FL THEN 710
690 PX=PX-7:IF PX>26 THEN 400
700 FL=-1:SOUND 160,.3:GOTO 440
710 PX=PX+7:IF PX<233 THEN 400
720 IF PY<135 THEN FL=0:SOUND 160,.3:PX=233:GOTO 400
730 PUT (CP(RC,1),CP(RC,2)),CAUL
740 RC=INT(RND*6)+1:IF RC=LC THEN 740
750 LC=RC:DF=DF+1:SC=SC+200:GOTO 320
760 FOR X=2 TO 32:SOUND RND*100+40,.3
770 COLOR X:NEXT X:COLOR 0,2:IF SC>HS THEN HS=SC
780 CLS:PRINT "You ran into something"
790 PRINT "that you shouldn't have!":PRINT
800 PRINT "Your score was";STR$(SC);","
810 PRINT "high score is";STR$(HS);".":PRINT
820 PRINT "Press <P> to play again,"
830 PRINT "or <Q> to quit."
840 K$=INKEY$:IF K$="" THEN 840
850 K=ASC(K$):K$=CHR$(K-(K>96)*(K<123)*32)
860 IF K$<>"P" AND K$<>"Q" THEN 840
870 IF K$="P" THEN 220
880 DEF SEG:SCREEN 0,0:CLS:KEY ON:END
1000 READ KO,TL:CLS:FOR Y=1 TO TL
1010 READ A,B,C,D:LINE (A,B)-(C,D),KO:NEXT Y:RETURN
2000 ON LVL GOTO 2010,2020,2030,2040
2010 PUT (P(1),38),BROOM:RETURN
2020 PUT (P(2),65),TRUNK:RETURN
```

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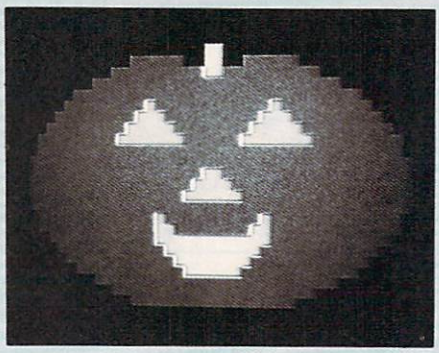
CIRCLE READER SERVICE 14

```
2030 PUT (P(3),93),SACK:RETURN
2040 PUT (P(4),120),PUMP:RETURN
3000 DATA 105,67,160,67,165,94,160,121,90,148,145,148
4000 DATA 5,35,150,1,150,1,308,16,20,48,115,48,160,48
4010 DATA 260,48,20,75,65,75,100,75,180,75,215,75,260
4020 DATA 75,20,102,115,102,160,102,260,102,20,129,65
4030 DATA 129,100,129,180,129,215,129,260,129
5000 DATA 115,156,62,216,115,156,62,216
6000 DATA 3,5,4,1,4,5,3,6,5,6,2,7,6,7,2,8,6,8,1,9,7,9
6010 DATA 2,12,3,1,4,1,4,1,4,3,3,3,7,3,2,4,8,4,1,5,2,5
6020 DATA 8,5,9,5,5,4,5,6,1,6,9,6,1,7,3,7,7,7,9,7,2,8
6030 DATA 8,8,3,9,7,9,1,8,1,1,13,1,2,2,12,2,3,3,11,3
6040 DATA 3,4,11,4,3,5,11,5,3,6,11,6,3,7,11,7,4,8,10,8
6050 DATA 1,16,3,1,7,1,3,2,3,2,5,2,5,2,7,2,7,2,1,3,9,3
6060 DATA 3,4,7,4,3,5,7,5,3,6,7,6,1,4,1,5,9,4,9,5,3,7
6070 DATA 3,9,4,7,4,9,6,6,6,9,7,7,7,9,2,9,2,9,8,9,8,9
6080 DATA 3,9,2,1,7,1,3,2,6,2,3,3,6,3,2,4,7,4,1,5,8,5
6090 DATA 1,6,8,6,1,7,8,7,2,8,7,8,3,9,6,9,2,8,1,4,1,9
6100 DATA 2,4,2,9,4,4,4,9,5,4,5,5,5,7,5,9,6,4,6,9,8,4
6110 DATA 8,9,9,4,9,9
6120 DATA "R3U1R2D6L23U1R1U1R1U1R2U1R4D1R1BM8,8;"
6130 DATA "L3U1L2D6R23U1L1U1L1U1L2U1L4D1L1BM7,9;"
```

JACK-O'-LANTERN

BY JOEY LATIMER



Jack-O'-Lantern was first presented in our October 1983 issue and was such a hit then that we decided to rerun the colorful pumpkin graphic program for those of you who missed it the first time. So, throw out your Swiss army knife; this Halloween you can carve a pumpkin with a cursor! That's right: just type this program into your computer, run it, and your computer will create a *Jack-O'-Lantern* right on your screen! Put the monitor in your front window and sit back as your pumpkin becomes the talk of the town.

Adam & Apple II series/*Jack-O'-Lantern*

```
10 HOME
20 GR:COLOR= 9
30 HLIN 11,16 AT 2
40 FOR Z = 2 TO 39
50 READ X,Y
60 HLIN X,Y AT Z
70 NEXT Z
80 COLOR= 13
90 FOR Z = 9 TO 13
100 READ X,Y
110 HLIN X,Y AT Z
120 HLIN X+11,Y+11 AT Z
130 NEXT Z
140 FOR Z = 19 TO 22
150 READ X,Y
160 HLIN X,Y AT Z
170 NEXT Z
180 FOR Z = 27 TO 30
190 READ X,Y
200 HLIN X,Y AT Z
210 NEXT Z
220 COLOR= 8
230 FOR Z = 0 TO 4
240 HLIN 18,19 AT Z
250 NEXT Z
260 GOTO 260
1000 DATA 21,26,9,28,8,29,7,30,6,31,5,32,4,33
1010 DATA 4,33,3,34,2,35,2,35,1,36,1,36,0,37
1020 DATA 0,37,0,37,0,37,0,37,0,37,0,37,0,37
1030 DATA 1,36,1,36,2,35,2,35,2,35,3,34,3,34
1040 DATA 4,33,5,32,6,31,7,30,8,29,9,28,10,27
1050 DATA 12,25,14,23,15,22,13,13,12,14,11,15
1060 DATA 10,16,9,17,18,19,17,20,16,21,15,22
1070 DATA 12,25,13,24,14,23,15,22
```

Atari 800/XL/XE/*Jack-O'-Lantern*

```
10 PRINT CHR$(125)
20 GRAPHICS 3+16
30 COLOR 1
40 FOR R=1 TO 24
50 READ X,Y,X1,Y1
60 PLOT X,Y
70 DRAWTO X1,Y1
80 NEXT R
90 COLOR 2
100 FOR R=1 TO 14
110 READ X,Y
120 PLOT X,Y
130 NEXT R
140 FOR R=1 TO 13
150 READ X,Y,X1,Y1
160 PLOT X,Y
170 DRAWTO X1,Y1
180 NEXT R
190 GOTO 190
1000 DATA 11,1,16,1,23,1,28,1,9,2,30,2,7,3,32,3,5,4
1010 DATA 34,4,4,5,35,5,3,6,36,6,2,7,37,7,38,8,1,8,1,9
1020 DATA 38,9,39,10,0,10,0,11,39,11,39,12,0,12,0,13
1030 DATA 39,13,39,14,0,14,1,15,38,15,38,16,1,16,2,17
1040 DATA 37,17,36,18,3,18,4,19,35,19,34,20,5,20,7,21
1050 DATA 32,21,30,22,9,22,11,23,28,23,19,0,20,0,19,1
1060 DATA 20,1,19,2,20,2,13,5,26,5,14,15,25,15,14,16
1070 DATA 15,16,24,16,25,16,12,6,14,6,25,6,27,6,11,7
1080 DATA 15,7,24,7,28,7,10,8,16,8,23,8,29,8,19,11,20
1090 DATA 11,18,12,21,12,17,13,22,13,14,17,25,17,15
1100 DATA 18,24,18,16,19,23,19,17,20,22,20
```

Commodore 64 & 128 (C64 mode)/*Jack-O'-Lantern*

```
10 PRINT CHR$(147)
20 POKE 53281,0:POKE 53280,0
30 FOR Z=1 TO 24
40 READ X,Y
50 FOR P=X TO Y
60 POKE P,160
70 POKE P+54272,8
80 NEXT P
90 NEXT Z
100 FOR Z=1 TO 15
110 READ X,Y
120 FOR P=X TO Y
130 POKE P,160
140 POKE P+54272,7
150 NEXT P
160 NEXT Z
170 FOR Z=1 TO 2
180 READ X,Y
190 FOR P=X TO Y
200 POKE P,160
```

```
210 POKE P+54272,9
220 NEXT P
230 NEXT Z
240 GOTO 240
1000 DATA 1078,1089,1114,1133,1151,1176,1189,1218,1228
1010 DATA 1259,1267,1300,1306,1341,1345,1382,1385,1422
1020 DATA 1424,1463,1464,1503,1504,1543,1544,1583,1584
1030 DATA 1623,1624,1663,1665,1702,1706,1741,1747,1780
1040 DATA 1788,1819,1829,1858,1870,1897,1912,1935,1954
1050 DATA 1973,1996,2011,1237,1237,1250,1250,1276,1278
1060 DATA 1289,1291,1315,1319,1328,1332,1354,1360,1367
1070 DATA 1373,1483,1484,1522,1525,1561,1566
1080 DATA 1678,1689,1719,1728,1760,1767,1801
1090 DATA 1806,1043,1044,1083,1084
```

IBM PC & compatibles/*Jack-O'-Lantern*

```
10 DEF SEG=&H40
20 IF (PEEK(&H10) AND 48)=32 THEN WIDTH 40
30 DEF SEG
40 SCREEN 0,0
50 KEY OFF
60 LOCATE ,,0
70 COLOR 12,0
80 CLS
90 FOR Y=2 TO 23
100 READ L
110 LOCATE Y,INT((40-L)/2+1):PRINT STRING$(L,219);
120 NEXT Y
130 COLOR 6
140 LOCATE 1,20:PRINT STRING$(2,219)
150 LOCATE 2,20:PRINT STRING$(2,219)
160 COLOR 10
170 FOR Y=6 TO 9
180 READ L
190 LOCATE Y,20-Y:PRINT STRING$(L,219)
200 LOCATE Y,33-Y:PRINT STRING$(L,219)
210 NEXT Y
220 FOR Y=12 TO 14
230 READ L
240 LOCATE Y,32-Y:PRINT STRING$(L,219)
250 NEXT Y
260 FOR Y=17 TO 20
270 READ L
280 LOCATE Y,Y-2:PRINT STRING$(L,219)
290 NEXT Y
300 GOTO 300
1000 DATA 12,20,26,30,32,34,36,38,38,40,40
1010 DATA 40,40,40,40,38,36,34,32,30,24,20
1020 DATA 1,3,5,7,2,4,6,12,10,8,6
```

Tandy Color Computer/*Jack-O'-Lantern*

```
10 CLS(0)
20 FOR Y=2 TO 29
30 P=1
40 IF Y>6 AND Y<12 THEN P=3:GOTO 60
50 IF Y>13 AND Y<26 THEN P=2
60 FOR L=1 TO P
70 READ B,E
80 FOR X=B TO E
90 SET (X,Y,8)
100 NEXT X
110 NEXT L
120 NEXT Y
130 FOR Y=0 TO 3
140 FOR X=30 TO 33
150 SET (X,Y,1)
160 NEXT X
170 NEXT Y
180 GOTO 180
1000 DATA 20,43,16,47,13,50,10,53,9,54,8,19
1010 DATA 23,40,44,55,7,18,24,39,45,56,6,17
1020 DATA 25,38,46,57,6,16,26,37,47,57,6,15,27
1030 DATA 36,48,57,4,59,4,59,4,30,33,59,4,29
1040 DATA 34,59,4,28,35,59,4,27,36,59,4,30,31
1050 DATA 59,6,30,31,57,6,30,31,57,6,19,44,57
1060 DATA 7,20,43,56,8,21,42,55,9,22,41,54
1070 DATA 11,23,40,52,13,50,15,48,18,45,21,42
```

TI-99/4A/*Jack-O'-Lantern*

```
10 CALL CLEAR
20 CALL SCREEN(2)
30 A$="FFFFFFFFFFFFFFFF"
40 CALL CHAR(96,A$)
50 CALL CHAR(104,A$)
60 CALL CHAR(112,A$)
70 CALL COLOR(9,7,1)
80 FOR Y=2 TO 24
90 READ X1,X2
100 FOR P=X1 TO X2
110 CALL HCHAR(Y,P,96)
120 NEXT P
130 NEXT Y
140 CALL COLOR(10,13,1)
150 FOR Y=1 TO 3
160 FOR X=16 TO 17
170 CALL HCHAR(Y,X,104)
180 NEXT X
190 NEXT Y
200 CALL COLOR(11,3,1)
210 FOR Y=7 TO 10
220 READ X1,X2
230 FOR X=X1 TO X2
240 CALL HCHAR(Y,X,112)
250 CALL HCHAR(Y,X+11,112)
260 NEXT X
270 NEXT Y
280 FOR L=1 TO 6
290 READ Y,X1,X2
300 FOR X=X1 TO X2
310 CALL HCHAR(Y,X,112)
320 NEXT X
330 NEXT L
340 GOTO 340
1000 DATA 11,22,9,24,7,26,6,27,4,29,3,30,2,31,1,32
1010 DATA 1,32,1,32,1,32,1,32,1,32,2,31,2,31,3,30
1020 DATA 3,30,4,29,5,28,6,27,7,26,9,24,12,21,11,11
1030 DATA 10,12,9,13,8,14,13,16,17,14,15,18
1040 DATA 15,14,19,18,12,21,19,13,20,20,14,19
```

CROSSWORD PUZZLER

BY STEVE C.M. CHEN AND KAREN KANE

This is the fourth in a series of crossword puzzles. This month, clues and data for a Halloween puzzle are presented along with the solution to last month's puzzle (page 84). The solution to the Halloween Crossword Puzzler will appear in next month's issue along with data for a new puzzle.

In order to solve or print out the puzzle, you must have the master puzzle program. The Commodore 64/128, IBM PC and compatibles, and Tandy Color Computer versions of the program were presented in the July issue, and the Adam, Apple, Atari, and Macintosh versions appeared in August. Copies of the July and August issues are available for $3.95 each from Crossword Puzzler, c/o FAMILY & HOME-OFFICE COMPUTING, *730 Broadway, New York, NY 10003. Please indicate your specific brand and model of computer.*

HALLOWEEN PUZZLE DATA

```
A DAEA,JAEB,KBEC,FCGC,1093
B KCFD,GDKD,LDCE,EFLF,1127
C MFNF,AGGG,IGMG,NGOG,1164
D AHBH,EHFH,GHHH,IHJH,1136
E KHNH,OHAI,BICI,GIII,1155
F OIBJ,CJDJ,KJMK,DLEL,1165
G ILJL,EMIM,JMKM,ENKN,1198
H FOKO,LOZZ,ZZZZ,ZZZZ,6358
```

HALLOWEEN PUZZLE CLUES

Across

1A German article
1F Indian tribe
1K Each in his place, by right, not ————————, shall rule his heritage . . . —Rudyard Kipling
2A Leave out
2F Giggle
2L Symbol of worship
3A Western European alliance
3H What family and homely have in common
3L Points of convergence
4A Color of a clear sky
4H Post Office Box, abbr.
4M Ghost sound
5A Symbol for titanium
5D What kids say on Halloween
6A Inner, comb. form
6F Cereal fruit
7B Dirt
7J Diphtheria, tetanus, pertussis vaccine, abbr.
8C Exists
8L A conjunction
9D Finish
9J Idols
10E Safe
10L What Kong is
11A Halloween event
11N An interjection
12A Likely
12F Cereal grass
12K Mr. Agnew
13A To raise upright
13F Norfolk State University, abbr.
13L Irritates
14A One of the Great Lakes
14F To hold an office
14L Covered with gold
15A Nifty
15G Not living
15M Socioeconomic status, abbr.

Down

1A Give
1B A kind of Grace
1C Latin for place
1F First and last initials of author whose middle name is Wadsworth
1G A digraph
1H Jack-o'-lantern
1I Eskimo homes
1L Mountain range in N. Morocco on the Mediterranean
1M Sun-dried clay brick
1N Ingredient in Halloween candy
1O George and T.S.
2D Hare's opponent
2J A mix of two species
4E Comparative suffix
5F Anger
5G Western state, abbr.
5K Dynamite
6C Prefix with -cycle or -angle
7L He said, "That's all folks!"
8M 10L across, to Pierre
9E See 13F across
9F Evil spirits
9H Burst
9J Feminine pronoun
9N Piece of diving equipment
10A Frightened
10G Stopped
10I Dorm leader, abbr.
10O Kin to goblins
11B Plural of opus
11C Spot
11K Author Eliot
12M Tennessee state flower
13D Crimson
14I One of the 13 orig. states
14J This Mr. talked like a man

THE DUELIN' COMPUTER

BY JOEY LATIMER

The song, *Duelin' Banjos*, has been performed and recorded many times over the years. Some notable versions include the upbeat arrangement ending the Dillard's *Back Porch* album, the slow-building duet featuring the young boy in the movie *Deliverance*, and let's not forget Martin Mull's *Duelin' Tubas*. Well, now you can add *The Duelin' Computer* to the list. That's right! We've taken the popular bluegrass tune and arranged it for several popular computers.

To hear your computer trade "licks" with itself, just type the *The Duelin' Computer* program into your computer using BASIC, SAVE it, then RUN it. If you enter the program correctly, the screen will clear, the title will print on the screen, and your computer's sound chip will think it's from Kentucky.

Atari 800/XL/XE/*The Duelin' Computer*

```
10 DIM V1(132,2),V2(158,2),V3(63,2)
20 POKE 710,196:POKE 752,1
30 FOR X=1 TO 132:READ A,B:V1(X,1)=A:V1(X,2)=B:NEXT X
40 FOR X=1 TO 158:READ A,B:V2(X,1)=A:V2(X,2)=B:NEXT X
50 FOR X=1 TO 63:READ A,B:V3(X,1)=A:V3(X,2)=B:NEXT X
60 PRINT CHR$(125)
70 POSITION 8,8:PRINT "* THE DUELIN' COMPUTER *"
80 P1=1:P2=1:P3=1:T1=0:T2=0:T3=0
90 SOUND 1,V1(P1,1),10,8
100 SOUND 2,V2(P2,1),10,8:SOUND 3,V3(P3,1),10,6
110 FOR DE=1 TO 20:NEXT DE
120 T1=T1+1
130 IF T1=V1(P1,2) THEN T1=0:P1=P1+1:SOUND 1,0,0,0
140 T2=T2+1
150 IF T2=V2(P2,2) THEN T2=0:P2=P2+1:SOUND 2,0,0,0
160 T3=T3+1
170 IF T3=V3(P3,2) THEN T3=0:P3=P3+1:SOUND 3,0,0,0
180 IF P1<133 THEN 90
190 GOTO 80
999 REM --BASS--
1000 DATA 0,16,162,1,162,1,162,2,144,2,128,2,121,2
1010 DATA 108,2,121,2,128,2,0,16,162,1,162,1,162,2,144
1020 DATA 2,128,2,121,2,108,2,121,2,128,2,0,16,121,1
1030 DATA 121,1,121,2,108,2,96,2,91,2,81,2,91,2,96,2
1040 DATA 0,16,162,1,162,1,162,2,144,2,128,2,121,2
1050 DATA 108,2,121,2,128,2,0,16,108,1,108,1,108,2
1060 DATA 96,2,85,2,81,2,72,2,81,2,85,2,0,8,128,1
1070 DATA 128,1,128,2,121,2,128,2,0,8,128,1,128,1
1080 DATA 128,2,121,2,128,2,0,16,128,1,121,1,108,2
1090 DATA 128,2,121,2,144,2,128,2,162,2,144,2,0,16
1100 DATA 128,1,121,1,108,2,128,2,121,2,144,2,128,2
1110 DATA 162,2,144,4,162,2,162,2,144,2,128,2,162,2
1120 DATA 128,2,144,2,108,2,162,2,162,2,144,2,128,2
1130 DATA 162,4,144,2,128,2,121,4,162,4,121,4,162,4
1140 DATA 162,4,128,4,162,4,128,4,108,4,144,4,108,4
1150 DATA 193,2,173,2,162,4,128,4,162,4,144,2,128,2
1160 DATA 121,4,162,4,121,4,162,4,162,4,128,4,162,4
1170 DATA 128,4,108,4,144,4,108,4,193,2,173,2,162,4
1180 DATA 128,4,162,4,162,2
1999 REM --MELODY--
2000 DATA 81,1,81,1,81,2,72,2,64,2,60,2,53,2,60,2,64,2
2010 DATA 0,16,81,1,81,1,81,2,72,2,64,2,60,2,53,2,60,2
```

```
2020 DATA 64,2,0,16,60,1,60,1,60,2,53,2,47,2,45,2,40,2
2030 DATA 45,2,47,2,0,16,81,1,81,1,81,2,72,2,64,2,60,2
2040 DATA 53,2,60,2,64,2,0,16,53,1,53,1,53,2,47,2,42,2
2050 DATA 40,2,35,2,40,2,42,2,0,16,64,1,64,1,64,2,60,2
2060 DATA 64,2,0,8,64,1,64,1,64,2,60,2,64,2,0,8,64,1
2070 DATA 60,1,53,2,64,2,60,2,72,2,64,2,81,2,72,2,0,16
2080 DATA 64,1,60,1,53,2,64,2,60,2,72,2,64,2,81,2,72,2
2090 DATA 0,18,81,2,81,2,72,2,64,2,81,2,64,2,72,2,53,2
2100 DATA 81,2,81,2,72,2,64,2,81,2,0,8,81,2,0,2,81,2,0
2110 DATA 2,81,2,0,2,81,2,0,2,81,2,0,2,81,2,0,2,81,2,0
2120 DATA 2,81,2,0,2,72,2,0,2,72,2,0,2,72,2,0,2,72,2,0
2130 DATA 2,81,2,0,2,81,2,0,2,81,2,0,2,81,2,0,2,81,2
2140 DATA 0,2,81,2,0,2,81,2,0,2,81,2,0,2,81,2,0,2,81
2150 DATA 2,0,2,81,2,0,2,81,2,0,2,72,2,0,2,72,2,0,2
2160 DATA 72,2,0,2,72,2,0,2,81,2,0,2,81,2,0,2,81,2,0,4
2999 REM --HARMONY--
3000 DATA 0,292,60,2,0,2,60,2,0,2,60,2,0,2,60,2,0,2,64
3010 DATA 2,0,2,64,2,0,2,64,2,0,2,64,2,0,2,53,2,0,2,53
3020 DATA 2,0,2,53,2,0,2,53,2,0,2,64,2,0,2,64,2,0,2,64
3030 DATA 2,0,2,64,2,0,2,60,2,0,2,60,2,0,2,60,2,0,2,60
3040 DATA 2,0,2,64,2,0,2,64,2,0,2,64,2,0,2,64,2,0,2,53
3050 DATA 2,0,2,53,2,0,2,53,2,0,2,53,2,0,2,64,2,0,2,64
3060 DATA 2,0,2,64,2,0,4
```

Commodore 64 & 128 (C 64 mode)/ *The Duelin' Computer*

```
10 DIM V1(132,3),V2(159,3),V3(64,3)
20 S=54272:FOR I=0 TO 23:POKE S+I,0:NEXT I
30 POKE S+24,15:POKE S+5,31:POKE S+6,241:POKE S+12,31
40 POKE S+13,241:POKE S+19,31:POKE S+20,241
50 FOR X=1 TO 132:READ V1(X,1),V1(X,2),V1(X,3):NEXT X
60 FOR X=1 TO 158:READ V2(X,1),V2(X,2),V2(X,3):NEXT X
70 FOR X=1 TO 63:READ V3(X,1),V3(X,2),V3(X,3):NEXT X
80 POKE 53281,0:POKE 53280,2
90 PRINT CHR$(147):POKE 214,10:PRINT
100 PRINT TAB(8);CHR$(5);"* THE DUELIN' COMPUTER *"
110 P1=1:P2=1:P3=1:T1=0:T2=0:T3=0
120 POKE S+1,V1(P1,1):POKE S,V1(P1,2)
130 POKE S+8,V2(P2,1):POKE S+7,V2(P2,2)
140 POKE S+15,V3(P3,1):POKE S+14,V3(P3,2)
150 POKE S+4,33:POKE S+11,33:POKE S+18,33
160 T1=T1+1
170 IF T1=V1(P1,3) THEN T1=0:P1=P1+1:POKE S+4,32
180 T2=T2+1
190 IF T2=V2(P2,3) THEN T2=0:P2=P2+1:POKE S+11,32
200 T3=T3+1
210 IF T3=V3(P3,3) THEN T3=0:P3=P3+1:POKE S+18,32
220 IF P1<133 THEN 120
230 GOTO 110
999 REM --BASS--
1000 DATA 0,0,16,12,143,1,12,143,1,12,143,2,14,24,2
1010 DATA 15,210,2,16,195,2,18,209,2,16,195,2,15,210,2
1020 DATA 0,0,16,12,143,1,12,143,1,12,143,2,14,24,2
1030 DATA 15,210,2,16,195,2,18,209,2,16,195,2,15,210,2
1040 DATA 0,0,16,16,195,1,16,195,1,16,195,2,18,209,2
1050 DATA 21,31,2,22,96,2,25,30,2,22,96,2,21,31,2
1060 DATA 0,0,16,12,143,1,12,143,1,12,143,2,14,24,2
1070 DATA 15,210,2,16,195,2,18,209,2,16,195,2,15,210,2
1080 DATA 0,0,16,18,209,1,18,209,1,18,209,2,21,31,2,23
1090 DATA 181,2,25,30,2,28,49,2,25,30,2,23,181,2
1100 DATA 0,0,8,15,210,1,15,210,1,15,210,2,16,195,2,15
1110 DATA 210,2,0,0,8,15,210,1,15,210,1,15,210,2,16
1120 DATA 195,2,15,210,2,0,0,16,15,210,1,16,195,1,18
1130 DATA 209,2,15,210,2,16,195,2,14,24,2,15,210,2,12
1140 DATA 143,2,14,24,2,0,0,16,15,210,1,16,195,1,18
1150 DATA 209,2,15,210,2,16,195,2,14,24,2,15,210,2,12
1160 DATA 143,2,14,24,4,12,143,2,12,143,2,14,24,2,15
1170 DATA 210,2,12,143,2,15,210,2,14,24,2,18,209,2
1180 DATA 12,143,2,12,143,2,14,24,2,15,210,2,12,143,4
1190 DATA 14,24,2,15,210,2,16,195,4,12,143,4,16,195,4
1200 DATA 12,143,4,12,143,4,15,210,4,12,143,4,15,210,4
1210 DATA 18,209,4,14,24,4,18,209,4,10,143,2,11,218,2
1220 DATA 12,143,4,15,210,4,12,143,4,14,24,2,15,210,2
1230 DATA 16,195,4,12,143,4,16,195,4,12,143,4,12,143,4
1240 DATA 15,210,4,12,143,4,15,210,4,18,209,4,14,24,4
1250 DATA 18,209,4,10,143,2,11,218,2,12,143,4,15,210,4
1260 DATA 12,143,4,12,143,2
1999 REM --MELODY--
2000 DATA 25,30,1,25,30,1,25,30,2,28,49,2,31,165,2
2010 DATA 33,135,2,37,162,2,33,135,2,31,165,2,0,0,16
2020 DATA 25,30,1,25,30,1,25,30,2,28,49,2,31,165,2
2030 DATA 33,135,2,37,162,2,33,135,2,31,165,2,0,0,16
2040 DATA 33,135,1,33,135,1,33,135,2,37,162,2,42,62
2050 DATA 2,44,193,2,50,60,2,44,193,2,42,62,2,0,0,16
2060 DATA 25,30,1,25,30,1,25,30,2,28,49,2,31,165,2
2070 DATA 33,135,2,37,162,2,33,135,2,31,165,2,0,0,16
2080 DATA 37,162,1,37,162,1,37,162,2,42,62,2,47,107,2
2090 DATA 50,60,2,56,99,2,50,60,2,47,107,2,0,0,16,31
2100 DATA 165,1,31,165,1,31,165,2,33,135,2,31,165,2,0
2110 DATA 0,8,31,165,1,31,165,1,31,165,2,33,135,2,31
2120 DATA 165,2,0,0,8,31,165,1,33,135,1,37,162,2,31
2130 DATA 165,2,33,135,2,28,49,2,31,165,2,25,30,2,28
2140 DATA 49,2,0,0,16,31,165,1,33,135,1,37,162,2,31
2150 DATA 165,2,33,135,2,28,49,2,31,165,2,25,30,2
2160 DATA 28,49,2,0,0,18,25,30,2,25,30,2,28,49,2,31
2170 DATA 165,2,25,30,2,31,165,2,28,49,2,37,162,2,25
2180 DATA 30,2,25,30,2,28,49,2,31,165,2,25,30,2,0,0
2190 DATA 8,25,30,2,0,0,2,25,30,2,0,0,2,25,30,2,0,0,2
2200 DATA 25,30,2,0,0,2,25,30,2,0,0,2,25,30,2,0,0,2,25
2210 DATA 30,2,0,0,2,25,30,2,0,0,2,28,49,2,0,0,2,28,49
2220 DATA 2,0,0,2,28,49,2,0,0,2,28,49,2,0,0,2,25,30,2
2230 DATA 0,0,2,25,30,2,0,0,2,25,30,2,0,0,2,25,30,2,0
2240 DATA 0,2,25,30,2,0,0,2,25,30,2,0,0,2,25,30,2,0,0
2250 DATA 2,25,30,2,0,0,2,25,30,2,0,0,2,25,30,2,0,0,2
2260 DATA 25,30,2,0,0,2,25,30,2,0,0,2,28,49,2,0,0,2,28
2270 DATA 49,2,0,0,2,28,49,2,0,0,2,28,49,2,0,0,2,25,30
2280 DATA 2,0,0,2,25,30,2,0,0,2,25,30,2,0,0,4
2999 REM --HARMONY--
3000 DATA 0,0,292,33,135,2,0,0,2,33,135,2,0,0,2,33,135
3010 DATA 2,0,0,2,33,135,2,0,0,2,31,165,2,0,0,2,31,165
3020 DATA 2,0,0,2,31,165,2,0,0,2,31,165,2,0,0,2,37,162
3030 DATA 2,0,0,2,37,162,2,0,0,2,37,162,2,0,0,2,37,162
3040 DATA 2,0,0,2,31,165,2,0,0,2,31,165,2,0,0,2,31,165
3050 DATA 2,0,0,2,31,165,2,0,0,2,33,135,2,0,0,2,33,135
3060 DATA 2,0,0,2,33,135,2,0,0,2,33,135,2,0,0,2,31,165
3070 DATA 2,0,0,2,31,165,2,0,0,2,31,165,2,0,0,2,31,165
3080 DATA 2,0,0,2,37,162,2,0,0,2,37,162,2,0,0,2,37,162
3090 DATA 2,0,0,2,37,162,2,0,0,2,31,165,2,0,0,2
3100 DATA 31,165,2,0,0,2,31,165,2,0,0,4
```

IBM PC*jr* & compatibles/*The Duelin' Computer*

```
10 DIM A$(19),B$(19),C$(19):SOUND ON:KEY OFF
20 FOR X=1 TO 19:READ A$(X):NEXT X
30 FOR X=1 TO 19:READ B$(X):NEXT X
40 FOR X=1 TO 19:READ C$(X):NEXT X:CLS:LOCATE 12,8
50 COLOR 3:PRINT "* THE DUELIN' COMPUTER *"
60 FOR X=1 TO 19:PLAY A$(X),B$(X),C$(X):NEXT X:GOTO 60
999 REM --BASS--
1000 DATA T255MN01P1P1L8GGL4GAB>CDC<B
1010 DATA P1P1L8GGL4GAB>CDC<B
1020 DATA P1P1L8>CCL4CDEFGFE
1030 DATA P1P1L8<GGL4GAB>CDC<B
1040 DATA P1P1L8>DDL4DEF#GAGF#
1050 DATA P1L8<BBL4B>C<B,P1L8BBL4B>C<B
1060 DATA P1P1L8B>CL4D<B>C<ABGA
1070 DATA P1P1L8B>CL4D<B>C<ABGA
1080 DATA P1P1L8B>CL4D<B>C<ABGAD
1090 DATA L4GGABGBADGGABG,P4L4GP4GP4GP4G
1100 DATA P4L4GP4GP4GP4G,P4L4AP4AP4AP4A
1110 DATA P4L4GP4GP4GP4G,P4L4GP4GP4GP4G
1120 DATA P4L4GP4GP4GP4G,P4L4AP4AP4AP4A
1130 DATA P4L4GP4GP4GP4
1999 REM --MELODY--
2000 DATA T255MN02L8GGL4GAB>CDC<BP1P1
2010 DATA L8GGL4GAB>CDC<BP1P1
2020 DATA L8>CCL4CDEFGFEP1P1
```

```
2030 DATA L8<GGL4GAB>CDC<BP1P1
2040 DATA L8>DDL4DEF#GAGF#P1P1
2050 DATA L8<BBL4B>C<BP1,L8BBL4B>C<BP1
2060 DATA L8B>CL4D<B>C<ABGAP1P1
2070 DATA L8B>CL4D<B>C<ABGAP1P1
2080 DATA L8B>CL4D<B>C<ABGAP1P1
2090 DATA L4GGABGBADGGABG,P4>CP4CP4CP4C
2100 DATA P4<BP4BP4BP4B,P4>DP4DP4DP4D
2110 DATA P4<BP4BP4BP4B,P4>CP4CP4CP4C
2120 DATA P4<BP4BP4BP4B,P4>DP4DP4DP4D
2130 DATA P4<BP4BP4BP4
2999 REM --HARMONY--
3000 DATA T255MN01P1P1P1P1,P1P1P1P1
3010 DATA P1P1P1P1,P1P1P1P1,P1P1P1P1,P1P1
3020 DATA P1P1,P1P1P1P1,P1P1P1P1,P1P1P1P1
3030 DATA P1P1P1P2A4B4,L2>C<G>C<G
3040 DATA GBGB,>D<A>D<L4EF#
3050 DATA L2GBGL4AB,L2>C<G>C<G
3060 DATA GBGB,>D<A>D<L4EF#,L2GBGB4
```

Macintosh/*The Duelin' Computer*

```
    DIM V1(132,2),V2(158,2),V3(63,2),WAV%(256)
    LOCATE 8,22:PRINT "* THE DUELIN' COMPUTER *"
    FOR X=-128 TO 127:WAV%(X+129)=X:NEXT X
    WAVE 0,WAV%:WAVE 1,WAV%:WAVE 2,WAV%
    FOR X=1 TO 132:READ V1(X,1),V1(X,2):NEXT X
    FOR X=1 TO 158:READ V2(X,1),V2(X,2):NEXT X
    FOR X=1 TO 63:READ V3(X,1),V3(X,2):NEXT X
  INITIALIZE:
    P1=1:P2=1:P3=1:T1=1:T2=1:T3=1
  SOUNDLOOP:
    IF T1=V1(P1,2) THEN SOUND V1(P1,1),2.3,,0:SOUND 0,
.3,,0:T1=0:P1=P1+1 ELSE SOUND V1(P1,1),2.6,,0
    IF T2=V2(P2,2) THEN SOUND V2(P2,1),2.3,,1:SOUND 0,
.3,,1:T2=0:P2=P2+1 ELSE SOUND V2(P2,1),2.6,,1
    IF T3=V3(P3,2) THEN SOUND V3(P3,1),2.3,,2:SOUND 0,
.3,,2:T3=0:P3=P3+1 ELSE SOUND V3(P3,1),2.6,,2
    T1=T1+1:T2=T2+1:T3=T3+1
    IF P1<133 THEN SOUNDLOOP ELSE INITIALIZE
  REM --BASS--
    DATA 0,16,196,1,196,1,196,2,220,2,247,2,262,2
    DATA 294,2,262,2,247,2,0,16,196,1,196,1,196,2
    DATA 220,2,247,2,262,2,294,2,262,2,247,2,0,16
    DATA 262,1,262,1,262,2,294,2,330,2,349,2,392,2
    DATA 349,2,330,2,0,16,196,1,196,1,196,2,220,2
    DATA 247,2,262,2,294,2,262,2,247,2,0,16,294,1
    DATA 294,1,294,2,330,2,370,2,392,2,440,2,392,2
    DATA 370,2,0,8,247,1,247,1,247,2,262,2,247,2,0,8
    DATA 247,1,247,1,247,2,262,2,247,2,0,16,247,1
    DATA 262,1,294,2,247,2,262,2,220,2,247,2,196,2
    DATA 220,2,0,16,247,1,262,1,294,2,247,2,262,2
    DATA 220,2,247,2,196,2,220,4,196,2,196,2,220,2
    DATA 247,2,196,2,247,2,220,2,294,2,196,2,196,2
    DATA 220,2,247,2,196,4,220,2,247,2,264,4,196,4
    DATA 262,4,196,4,196,4,247,4,196,4,247,4,294,4
    DATA 220,4,294,4,165,2,185,2,196,4,247,4,196,4
    DATA 220,2,247,2,262,4,196,4,262,4,196,4,196,4
    DATA 247,4,196,4,247,4,294,4,220,4,294,4,165,2
    DATA 185,2,196,4,247,4,196,4,196,2
  REM --MELODY--
    DATA 392,1,392,1,392,2,440,2,494,2,523,2,587,2
    DATA 523,2,494,2,0,16,392,1,392,1,392,2,440,2
    DATA 494,2,523,2,587,2,523,2,494,2,0,16,523,1
    DATA 523,1,523,2,587,2,659,2,698,2,784,2,698,2
    DATA 659,2,0,16,392,1,392,1,392,2,440,2,494,2
    DATA 523,2,587,2,523,2,494,2,0,16,587,1,587,1
    DATA 587,2,659,2,740,2,784,2,880,2,784,2,740
    DATA 2,0,16,494,1,494,1,494,2,523,2,494,2,0,8
    DATA 494,1,494,1,494,2,523,2,494,2,0,8,494,1
    DATA 523,1,587,2,494,2,523,2,440,2,494,2,392
    DATA 2,440,2,0,16,494,1,523,1,587,2,494,2,523,2
    DATA 440,2,494,2,392,2,440,2,0,18,392,2,392,2
    DATA 440,2,494,2,392,2,494,2,440,2,587,2,392,2
    DATA 392,2,440,2,494,2,392,2,0,8,392,2,0,2,392
    DATA 2,0,2,392,2,0,2,392,2,0,2,392,2,0,2,392,2,0
    DATA 2,392,2,0,2,392,2,0,2,440,2,0,2,440,2,0
    DATA 2,440,2,0,2,440,2,0,2,392,2,0,2,392,2,0,2,392
    DATA 2,0,2,392,2,0,2,392,2,0,2,392,2,0,2,392
    DATA 2,0,2,392,2,0,2,392,2,0,2,392,2,0,2,392,2,0
    DATA 2,392,2,0,2,440,2,0,2,440,2,0,2,440,2,0,2,440
    DATA 2,0,2,392,2,0,2,392,2,0,2,392,2,0,5
  REM --HARMONY--
    DATA 0,292,523,2,0,2,523,2,0,2,523,2,0,2,523,2,0
    DATA 2,494,2,0,2,494,2,0,2,494,2,0,2,494,2,0,2,587
    DATA 2,0,2,587,2,0,2,587,2,0,2,587,2,0,2,494,2,0
    DATA 2,494,2,0,2,494,2,0,2,494,2,0,2,523,2,0,2,523
    DATA 2,0,2,523,2,0,2,523,2,0,2,494,2,0,2,494,2,0
    DATA 2,494,2,0,2,494,2,0,2,587,2,0,2,587,2,0,2,587
    DATA 2,0,2,587,2,0,2,494,2,0,2,494,2,0,2,494,2,0,4
```

TI-99/4A w/TI Extended BASIC/*The Duelin' Computer*

```
10 DIM DT(9),DUR(225),FT(8,9),V1(225),V2(226),V3(226)
20 CALL CLEAR
30 FOR L=1 TO 9 :: READ DT(L):: NEXT L
40 FOR L=1 TO 8 :: FOR M=1 TO 9
50 READ FT(L,M):: NEXT M :: NEXT L
60 FOR L=1 TO 225 :: V1(L)=40000 :: V2(L)=40000
70 V3(L)=40000 :: NEXT L
80 FOR L=91 TO 110 :: READ DUR(L):: NEXT L
90 V=0 :: FOR L=0 TO 12 STEP 2 :: READ T
100 IF L>8 THEN V=20
110 FOR M=1 TO 9 :: P=L*9+M+V
120 DUR(P)=DT(M):: V2(P)=FT(T,M)
130 DUR(P+9)=DT(M):: V3(P+9)=FT(T+4,M)
140 NEXT M :: NEXT L :: DUR(146)=4
150 FOR L=91 TO 95 :: READ A,B
160 V2(L)=A :: V2(L+10)=A
170 V1(L+5)=B :: V1(L+15)=B :: NEXT L
180 FOR L=147 TO 225 :: READ V1(L)
190 DUR(L)=2 :: NEXT L
200 FOR L=147 TO 159 :: READ V2(L):: NEXT L
210 P=164 :: FOR L=1 TO 8 :: READ A,B
220 FOR M=1 TO 4 :: V2(P)=A :: V3(P)=B
230 P=P+2 :: NEXT M :: NEXT L :: V3(206)=595
240 PRINT " * THE DUELIN' COMPUTER *"
250 FOR L=1 TO 10 :: PRINT :: NEXT L
260 FOR L=1 TO 225
270 CALL SOUND(120*DUR(L),V1(L),2,V2(L),2,V3(L),4)
280 NEXT L :: GOTO 260
1000 DATA 1,1,2,2,2,2,2,2
2000 DATA 196,196,196,220,247,262,294,262,247
2010 DATA 262,262,262,294,330,349,392,349,330
2020 DATA 294,294,294,330,370,392,440,392,370
2030 DATA 247,262,294,247,262,220,247,196,220
2040 DATA 392,392,392,440,494,523,587,523,494
2050 DATA 523,523,523,587,659,698,784,698,659
2060 DATA 587,587,587,659,740,784,880,784,740
2070 DATA 494,523,587,494,523,440,494,392,440
3000 DATA 1,1,2,2,2,1,1,2,2,2,1,1,2,2,2,1,1,2,2,2
4000 DATA 1,1,2,1,3,4,4
5000 DATA 494,247,494,247,494,247,523,262,494,247
6000 DATA 196,196,220,247,196,247,220,294,196,196,220
6010 DATA 247,196,196,220,247,264,264,196,196,262,262
6020 DATA 196,196,196,196,247,247,196,196,247,247,294
6030 DATA 294,220,220,294,294,165,185,196,196,247,247
6040 DATA 196,196,220,247,262,262,196,196,262,262,196
6050 DATA 196,196,196,247,247,196,196,247,247,294,294
6060 DATA 220,220,294,294,165,185,196,196,247,247,196
6070 DATA 196,196,392,392,440,494,392,494,440,587,392
6080 DATA 392,440,494,392
7000 DATA 392,523,392,494,440,587,392,494,392
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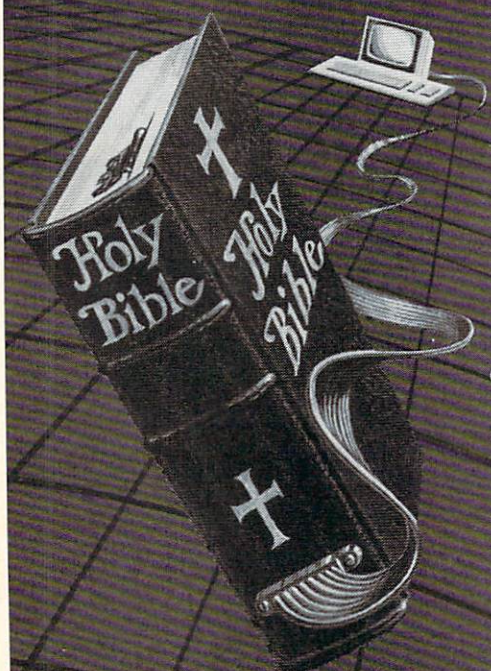

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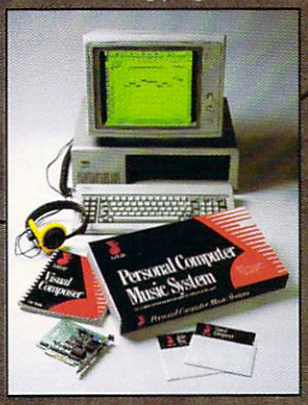

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